TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

NOVEMBER 15, 1960
Price 50c

V 66 #22

"KEEPING UP WITH COMMUNICATIONS"

Commercial Features of DDD, by Paul H. Kaufmam

"PROFITS FROM BOLD-FACE LISTINGS"

Automatic Message Composer, by H. A. Gross

✻ SERVING THE YELLOW PAGES FIFTY YEARS

✻ L. M. BERRY
AND COMPANY

MAIN OFFICES: HULMAN BUILDING • DAYTON 2, OHIO • TELEPHONE BALDWIN 4-7421

Telephone Directory Advertising Exclusively

Since 1910

TELEPHONE ENGINEER & MANAGEMENT

Published on the 1st and 15th of each month by

TELEPHONE ENGINEER PUBLISHING CORP.
7720 Sheridan Road, Chicago 26, Ill.

Telephone
ROgers Park 4-3040
Chicago

EDITORIAL STAFF

ROY F. SMITH
Publisher

JOHN G. REYNOLDS
Editor

DICK REYNOLDS
Production Mgr.

JANE KELLEY
Editorial Assistant

JOHN S. REED
Technical Editor

ROLAND DAVIES & FRED HENCK
Washington Editors

Contributing Editors
BILL CORMAN
C. D. EHINGER
L. A. GRITTEN
D. A. PERIGO
ALLAN R. STACEY

ADVERTISING STAFF

DONALD C. SORENSEN
Advertising Manager

RAY GERACI
Promotion Manager

BETSY MEYERS
Advertising Assistant

KEITH H. EVANS & ASSOCIATES
3723 Wilshire Blvd.
Los Angeles 5, Calif.
Tel. — DUnkirk 8-2981
515 Market St., Rm. 225,
San Francisco 5, Calif.
Tel. — YUkon 2-4280

BUSINESS STAFF

ROY F. SMITH
President

DONALD C. SORENSEN
Executive Vice President

JOHN G. REYNOLDS
Vice President

BETTY SCHROEDER
Corporate Secretary

PAT LAWHORN
Circulation Manager

BPA

Member of
Business Publications
Audit of Circulation, Inc.

Average Total Qualified Circulation
For 12-Month Period Ending June 1960,
13,817

TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

VOL. 64 NO. 22 NOV. 15, 1960

CONTENTS

ASSOCIATIONS
Coming Conventions 8
Michigan Independents Hold 25th Convention 46

COMMERCIAL
"Profits From Bold Face Listings" ..... Allan R Stacey 42

COMMUNICATIONS
Keeping Up With Communications 14
Automatic Message Composer ..... H. A. Gross 34

DIRECT DISTANCE DIALING
Commercial Features of DDD ..... Paul H. Kaufman 32

ELECTRONICS
Electronic Communications 36

INDUSTRY NEWS & COMMENT
Industry Observations ..... L. A. Gritten 10
Industry Views 24
Communication Securities 43
The Back of the Book ..... John G. Reynolds 88

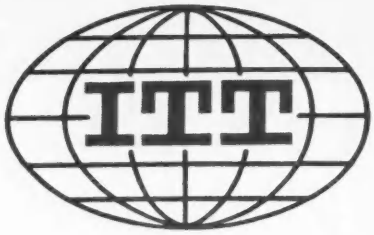
PRODUCTS & SERVICES
New Products' Showcase ..... Dick Reynolds 67
The Telephone Market Place (Classified Advertising) 78
Advertisers' Index 87

WASHINGTON
Washington Observations ..... Roland Davies & Fred Henck 18

THE TE&M FRONT COVER

Postmaster General ARTHUR E. SUMMERFIELD after arriving at Mackinac Island by jet and helicopter relaxes in carriage in drive to Grand Hotel accompanied by Michigan Convention Chairman R. J. SCHAFER and Mrs. SCHAFER of Pinconning, Mich. — (For complete story see page 46.)

Volume 64, No. 22. Published on the 1st and 15th of each month by TELEPHONE ENGINEER PUBLISHING CORP., 7720 Sheridan Rd., Chicago 26, Ill. Office of publication 600 S. 7th St., Rochelle, Ill. Subscriptions, U. S. and Possessions, $4.00 per year; Canada, $4.50; in all other countries, $6.50. Single Copies, U. S. A., 50 cents. Entered as Second Class matter at the post office at Rochelle, Ill. under the act of March 3, 1879. Copyright 1960 by Telephone Engineer Publishing Corp., 7720 N. Sheridan Rd., Chicago 26, Ill.
POSTMASTER . . . Please send form 3579 to TELEPHONE ENGINEER & MANAGEMENT, 7720 N. Sheridan Rd., Chicago 26, Ill.



your
KELLOGG
representative
is ready
to show you*
THE ALL-NEW

SELL-A-PHONE

PROMOTIONAL
PROGRAMS

a merchandising first
for your independent
telephone company

EVERYTHING TO SELL MORE HOME TELEPHONE SERVICES

...both to subscribers and non-subscribers

3 complete sales plans:

Complete with all the advertising and sales promotion material necessary to make them successful . . . with little effort on your part!

HERE'S YOUR SELL-A-PHONE PROMOTIONAL MATERIALS
EVERYTHING YOU NEED TO SELL!
something "extra" to color their thinking
NEW
BYE BYE BLACK

EVERYTHING TO SELL MORE BUSINESS SUBSCRIBER SERVICES

...for every size, every kind of business

the first truly portable key-phone demonstration kit...

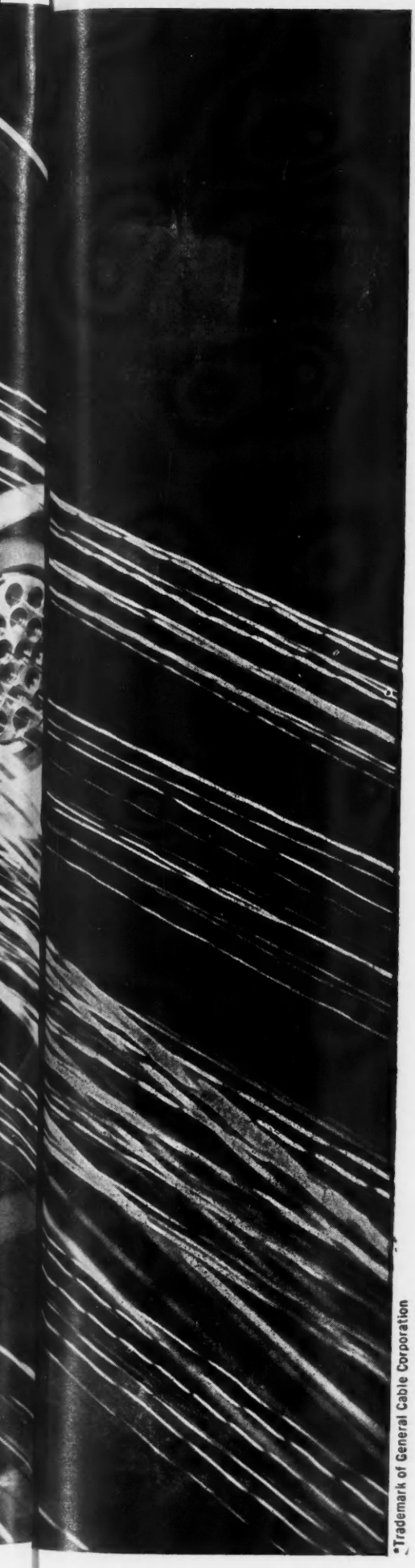
. . plus all the material

- to get inquiries
- to follow through
- to quote on installations
- to train your salesmen

Your local representative will be in soon to give you the whole story!

ITT **KELLOGG**

A Division of
International Telephone and Telegraph Corporation
6650 South Cicero Avenue, Chicago 38, Illinois



QUALPETH*

A NEW LINE OF QUALITY ENGINEERED TELEPHONE CABLES

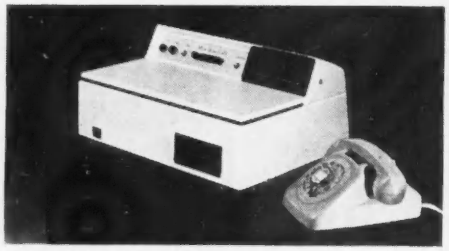
Only Qualpeth telephone cables offer these new, exclusive features for the finest in transmission and performance. **Reduced cross talk** with a new oscillating face plate method of stranding pairs into units. This method insures freedom from parallelism between a pair in one unit and a pair in another unit. The end result, cross talk characteristics are greatly improved. **Polyethylene binders:** colored polyethylene binder tapes provide easy identification due to color brilliance and freedom from fraying. **Tape over shield:** an acetate tape applied over overlapped edge of smooth shield provides protection against cutting into sheath. **Sheath uniformity gauge:** tests every foot of Qualpeth cable during extrusion for thickness and concentricity of sheath. Upon customer request, Qualpeth cables will be shipped under positive pressure. Your way of checking against hidden shipment and installation damages. Qualpeth cables are available with aluminum or copper shields, in single or double sheaths, for aerial (including new Figure 8 self-supporting messenger type) duct or direct earth burial installation. Call our distributors for complete details about this outstanding line of telephone cables . . . quality-engineered to give you the finest. **Available for shipment on November 1, 1960.** General Cable Corporation, 730 Third Ave., New York 17, N.Y.

*Trademark of General Cable Corporation

Distributed by: Automatic Electric Sales Corporation, Northlake, Illinois; Leich Sales Corporation, 427 West Randolph Street, Chicago 6, Illinois.

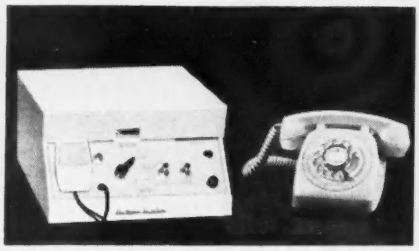
GCC GENERAL CABLE CORPORATION

New line of ELECTRONIC SECRETARY telephone answering sets



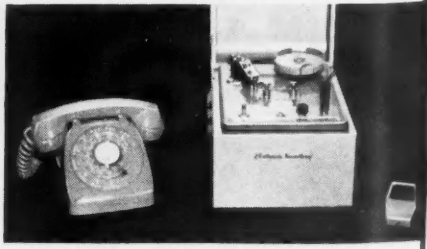
LP(Long Play) model

The de luxe model that "does everything." Answers the phone automatically with message prerecorded by customer—(easily "erased" and changed)—records incoming messages, plays them back when customer returns. Takes any number of incoming messages up to 2-hour capacity. For service companies and individuals, stores, offices, plants and specialized uses in many other types of business.



SP (Short Play) model

This performs the same answering function as the LP model but has a more limited capacity. Answers the phone, gives message to caller, records up to twelve 13-second incoming messages. Compact, about typewriter size. Specially designed for the small service outfit or business. Low monthly rental greatly broadens the market.



AO (Answer Only) model

Answers phone with prerecorded announcement, b does not record incoming calls. Has microphone a tape recorder. Used by all sorts of organizations deliver informative announcements up to 3 minute Theatres tell what's playing. Fuel suppliers and othe leave numbers to call for emergency service at nigh Advertisers sponsor weather reports, stock closing Churches give inspirational messages.

ational advertising program will help you win customers for new full line of automatic answering sets

arting soon, exciting national advertising will spread the ord of the new concept in telephone service—telling mil- ons all about the new ELECTRONIC SECRETARY® one answering sets that "fill the chair when you're not ere."

his advertising will tell the story to thousands of custom- s right in your own area. And what a story it is!

ully automated answering or every purpose

ere for the first time is a complete line of practical, com- ct devices to meet the individual needs of almost any stomer. If he has to be out of his place of business during e day the ELECTRONIC SECRETARY set will tend the one in his absence. If desired it will answer his phone ghts, Sundays and holidays. There is also an "Answer ly" set to make informative announcements.

ow realtors, TV-service repairmen, lawyers, doctors and her small businessmen can be "in" even when they're out.

Now larger companies take sales orders and reports 24 hours a day. Theatres, municipal governments, weather bureaus, etc., can deliver recorded messages to the many people who call for information.

Virtually anyone who does business by phone is a potential customer for an ELECTRONIC SECRETARY set. The market—and the profit you can earn from it—are almost limitless.

Helping your salesmen sell

In addition to national advertising, you'll get help at the local level. There is a complete kit to help your salesmen. And another complete kit of promotional material to help every ELECTRONIC SECRETARY set user promote his new service.

Local market tests prove this selling program will create a sizeable demand in your area. So be sure you're prepared to meet it. For full information on how ELECTRONIC SECRETARY sets can add to your revenues, call or write one of the distributors listed below.

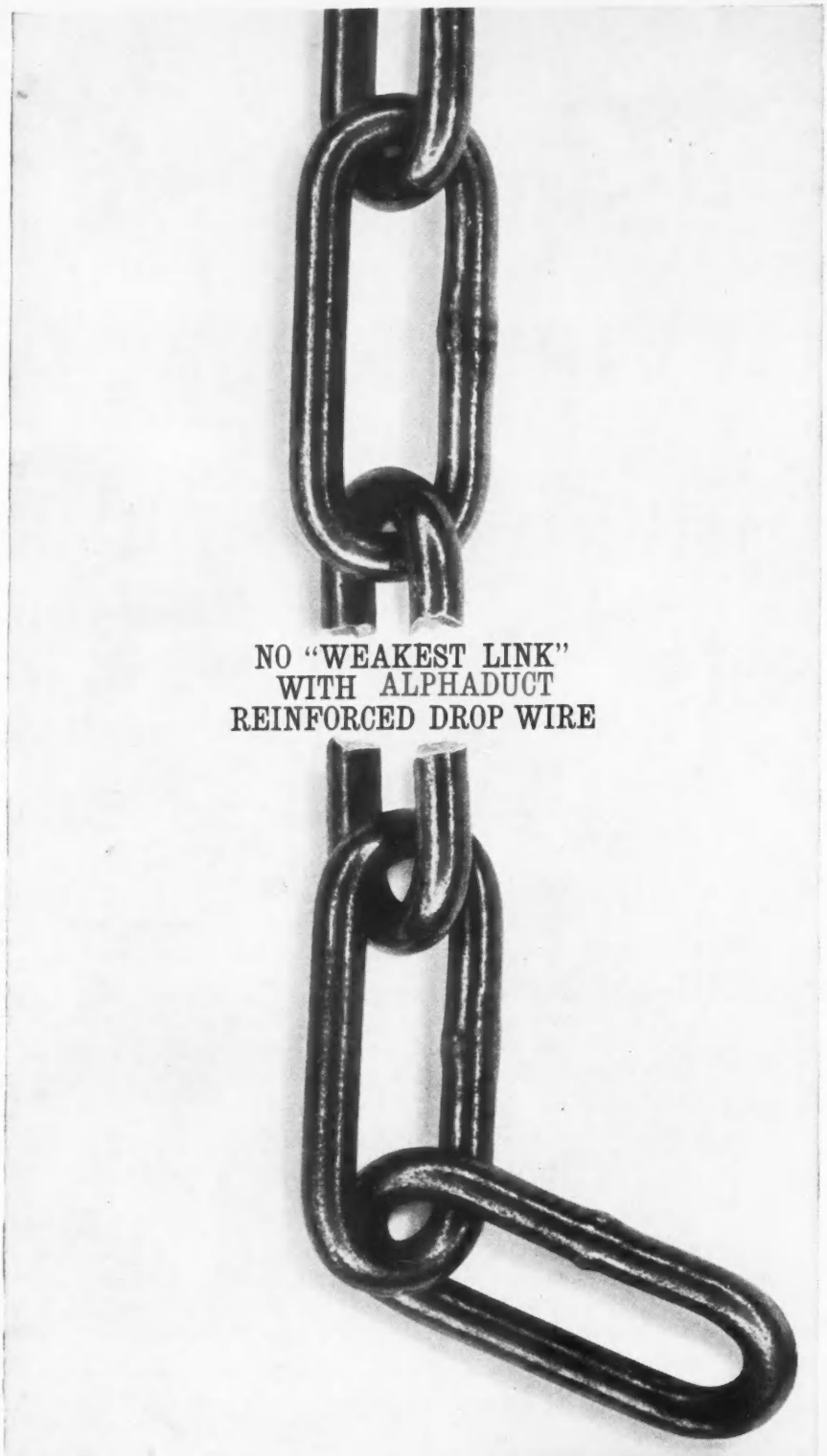
lectronic Secretary Industries, Inc., Subsidiary of GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

distributed by

AUTOMATIC ELECTRIC SALES CORPORATION
00 North Wolf Road Northlake, Illinois

LEICH SALES CORPORATION
427 West Randolph St., Chicago 6, Illinois



NO "WEAKEST LINK"
WITH ALPHADUCT
REINFORCED DROP WIRE

Only Alphaduct Reinforced Drop Wire has a combination of built-in features that guarantee no "weak links." ■ Balanced breaking strength of the conductors — 400 pounds plus, with #18 AWG, 30%, copperweld. • Adhesion of the insulation—strong enough to prevent slipping at maximum load without physical or electrical failure. • Neoprene jacket—tough, abrasion and weather resistant with enough "beef" to prevent buckling at the "P" clamps all the way up to maximum conductor strength. • Compression cutting resistance—no break-down in "P" clamps up to overall breaking strength of the conductors. • This sturdy balanced construction resists deformation and provides greater protection against lightning failures. ■ Insist on Alphaduct Reinforced Drop Wire for lower installation costs and greater trouble-free service ...and remember, it's dated for comparison. ■■■■■

ALPHADUCT
WIRE AND CABLE CO.
NEW BRUNSWICK, N. J.

National Distributors: Automatic Electric Sales Corporation, P.O. Box 37, Northlake, Illinois Leich Sales Corporation, 427 W. Randolph Street, Chicago, Illinois **Regional Distributors:** Buckeye Telephone & Supply Co., Columbus, Ohio/The Lindsay Telephone Supply Co., Cleveland, Ohio/Pankey Supply Co., Charlottesville, Virginia

coming

CONVENTIONS

FLORIDA Tel. Assoc., Robt. Myer Hotel, Jacksonville, Fla., Nov. 28-29.

MILITARY ELECTRONICS CONVENTION, Biltmore Hotel, Los Angeles, Calif., Feb. 1, 2, 3, 1961.

LOUISIANA Tel. Assoc., Captain Shreve Hotel, Shreveport, La., Feb. 15-17, 1961.

MINNESOTA Tel. Assoc., Radison Hotel, Minn., Minn., Feb. 19-22, 1961.

KENTUCKY Tel. Assoc., Phoenix Hotel, Lexington, Ky., March 7, 1961.

TEXAS Tel. Assoc., Rice Hotel, Houston, Texas, March 12-14, 1961.

IOWA Tel. Assoc., Savery Hotel, Des Moines, Iowa, March 23-24, 1961.

INTERNATIONAL POLYTECHNIC SYMPOSIA, Auditorium of the Engineering Societies, New York City, April 4-6, 1961.

NEBRASKA Tel. Assoc., Cornhusker Hotel, Lincoln, Nebraska, April 5-6, 1961.

OHIO Tel. Assoc., Deshler Hilton Hotel, Columbus, Ohio, April 18-19, 1961.

ILLINOIS Tel. Assoc., Pere Marquette Hotel, Peoria, Ill., May 17-19, 1961.

KANSAS-MISSOURI Tel. Association, Continental Hotel, Kansas City, Mo., May 22-23, 1961.

PENNSYLVANIA Tel. Assoc., Poco Manor Inn, Poco Manor, Pa., June 5-7, 1961.

WASHINGTON-OREGON Tel. Assoc., Empress Hotel, Victoria, B. C., June 15-16, 1961.

NEW YORK Tel. Assoc., Scaroon Manor, Schroon Lake, N. Y., June 19-21, 1961.

Here is a Christmas Gift

TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

on the 1st and 15th of each month

- You can afford to give . . .
- You will be proud you gave to anyone in the telephone business . . .

YOUR ASSOCIATES — YOUR BOSS

YOUR EMPLOYEES — YOUR DAUGHTER

YOUR SON — OR WIFE MAYBE ? ?

24 BIG ISSUES

INCLUDING THESE SIX "SPECIALS"

January 15

TELEPHONE FORECAST EDITION

April 15

SPRING CONSTRUCTION ISSUE

July 15

TELEPHONE MERCHANDISING ISSUE

September 15

FALL CONSTRUCTION ISSUE

October 1

PRE-CONVENTION ISSUE

October 15

CONVENTION REPORT ISSUE

FEATURING

Exclusive and Timely Articles by TE&M's Staff, the Nation's Top Telephone Writers.

John G. Reynolds ..... **Editor**
Veteran Author & Telephone Trade Publication Editor

John S. Reed ..... **Technical Editor**
Engineer, Lincoln Telephone & Telegraph Co., Lincoln, Nebraska

Allan R. Stacey ..... **Commercial Dept. Editor**
General Mgr., Sunland-Tujunga Telephone Co., Sunland, California

D. A. Perigo ..... **Traffic Dept. Editor**
General Traffic Superintendent, West Coast Telephone Co., Everett, Wash.

G. M. Jones ..... **Accounting Dept. Editor**
Accounting & Financial Admin., Michigan State University

Roland Davies & Fred Henck ..... **Washington Editors**

Bill Corman ..... **Small Company Editor**
Manager, Southland Telephone Co., Atmore, Alabama

Leo G. Sands ..... **Electronics Notebook**
Communications Consultant & Author

C. D. Ehinger ..... **Sub-Harmonics & Overtones**
President, Citizens Telephone Co., Decatur, Indiana

Leslie A. Gritten ..... **Industry Observations**
Prominent in telephone affairs for over 57 years.

AND:

Special Guest "Assignments" from Executive Personnel of A. T. & T., Bell System, General Telephone & Electronics, Independent and REA Financed Telephone Companies.

CHRISTMAS GIFT RATES

(U. S. and Possessions)

1 year subscription	$3.50
Each additional sub.	3.00
Canada	4.00
Other Countries	6.50

Renewals — Same Rates

It's Christmas The Year Round when you give Telephone Engineer & Management

* Pushbutton Phones
* Bell Was There First
* Automation Blues
* Anti-Automation
* "Orbital Scatter"
* "Tensegrity"
* Facsimile Mail

INDUSTRY OBSERVATIONS by L. A. GRITTEN

Pushbutton Omnia Vincit

TELEPHONE dials have changed little since Almon B. Strowger introduced them 70 years ago, but now they face obsolescence. All-number pushbuttons will displace them. The human phases of the problem, what sort of buttons and how arranged, are presented by R. L. Deininger in the Bell System Technical Journal for July, 1960 ("Human Factors Engineering Studies of the Design and Use of Pushbutton Telephone Sets").

Pushbutton sets varying greatly in dimensions, arrangement, designation type and in "force displacement" characteristics were tested practically by groups of Bell Laboratory employes.

Of five arrangements that were given a final test, that most preferred by the users consisted of two horizontal rows of five buttons, reading 1-5 and 6-0, left to right; but this arrangement was the slowest; it showed the longest keying time.

The arrangement that showed the lowest error rate consisted of two vertical columns, 1-3-5-7-9 and 2-4-6-8-0, reading down; yet this arrangement ranked last in preference by those who made the test.

The lowest keying time was made by the familiar telephone dial arrangement, 1 to 0 in a circle, reading counterclockwise. However some recent advertisements appear to indicate that the final choice may be "Three by three, plus one," that is three horizontal rows 1-3, 4-6, 7-9, with the zero in a row by itself at the bottom.

In terms of keying performance, differences were not great (from 5.9 seconds to 6.17 seconds), so there is plenty of latitude for variations for plant reasons. But, concludes Mr. Deininger, "less latitude exists if preferences are considered, particularly in the case of the force-displacement characteristics. Typically, subjects preferred a smooth and quietly operating button with a light touch and moderate travel."

It was found that those who memorized the entire number could key a number in less than two seconds. Those who had to refer back, after keying part of the number, could take more than twelve seconds for the same number.

To the layman, this suggests that possibly the details of key design will be much less important than early training of our youngsters at school to memorize multi-digit numbers rapidly.

Graham Bell Was There First

AN AP RELEASE tells that on September 21, 1960, the U. S. Navy demonstrated its hydrofoil boat before a meeting of world scientists at The Hague, Netherlands. The aluminum-hulled craft is designed to skim over the water on its hydrofoils at speeds up to 80 miles an hour.

Forty years before that, William Nutting, magazine publisher and yachting enthusiast, made a trip on the hydrofoil glider H D-4, built by Alexander Graham Bell and Casey Baldwin at Baddeck, Novia Scotia. In his book "Track of the Typhoon," Nutting describes the Bell-Baldwin glider as "the fastest thing afloat" and shows a photograph of it going at 70 miles an hour, in October, 1920.

One may wonder how many other modern innovations we owe to inventors long since in their graves.

Automation Blues

UNION leaders, having done their best to create labor conditions that compel automation, now bewail its effect on labor. In the past six years, says C.W.A.'s President Joseph Beirne, 33,000 jobs have gone down the drain in the telephone industry alone. He proposes a Bureau of Automation, in the U. S. Department of Labor, to remedy the trouble.

In the steel industry, for similar reasons, union President David J. McDonald calls for a 32-hour week.

One would be naive indeed to support either suggestion. Another Government bureau would doubtless make some jobs — for bureaucrats; but its prospects of slowing the march of automation would be on a par with those of the courtiers ordered by King Canute to sweep back the ocean tides.

As for the 32-hour week in the U.S.A., that would be welcome news indeed to Nikita K. and the leaders of every country that is now toiling hard and long to beat us out of our own markets!

More Anti-Automation

WITH more pleasure and sympathy, we recite another protest against telephone automation. Don Gibbs, owner of the Redwoods Telephone Company (800 stations) at Cave Junction, Oregon, has sent us a Labor Day publication of the Illinois Valley Jubilee Association. It contains an editorial "Hospitality is Keynote," warmly praising the work of a Cave Junction operator who helped a

Please turn to page 12

INPUT
48 volts DC
from exchange battery

OUTPUT
24 volts DC
15 amps., 350 watts

THE *New* LORAIN BAT-TAP

another FIRST from LORAIN!
the only device delivering 24 volts DC
with full efficiency, full battery protection

NO POWER LOSS
Voltage reduction by CEMF cells or resistors wastes half the power used. Bat-Tap prevents this loss.

PROTECTS BATTERY
Voltage reduction by tapping the battery causes uneven charging and discharging of cells, unless an extra 24-volt charger is used on the cells involved. Bat-Tap protects your battery, needs no extra equipment.

NO MOVING PARTS
The Lorain Bat-Tap uses a new transistorized inductor arrangement combined with silicon diodes. 48-volt DC is first converted to AC, then to 24-volt DC in a simple, foolproof circuit.

SAFE ON OVERLOADS
Bat-Tap easily withstands intermittent overloads up to 30%.

FULL EFFICIENCY
Efficiencies are as high as 80 to 89% from 25% of rating to 30% overload. Efficiency at full load is 87.5%.

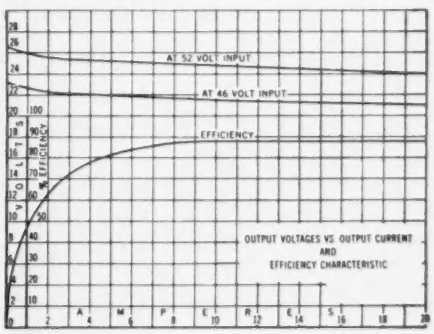
RATINGS
Model QB15A

Input: 44-52 volts, 0.5 ampere no load, 8 amperes 400 watts full load.

Output: 21-27 volts at full load of 15 amperes, 350 watts.

Regulation: 1.5 volt drop from 1 ampere to 15-ampere load.

Filtered input and output (output filtered to 2 millivolts).



EASY INSTALLATION
Bat-Tap requires only simple external connection of input and output leads. Fits 19″ relay rack. Height 6¾″. Depth 9¾″. Weight 32 lbs.

ZERO MAINTENANCE
The Lorain Bat-Tap never needs attention. There is nothing to wear out or need adjustment. Install it and you can forget about your 24-volt power supply.

POWER EQUIPMENT FOR COMMUNICATIONS AND INDUSTRY

our equipment is sold through leading telephone distributors

FLOTROL PARTNERS IN DEPENDABILITY SUB-CYCLE

LORAIN *Products Corporation*

1122 F Street Lorain, Ohio Phone: ATlantic 8-9191

visitor to locate his father, a mining engineer.

We quote in part: "The telephone system in the Valley is not an automatic dial system . . . This 'bridging the gap' in the middle of the night unfolded heartfelt gratitude that the operator, modestly enough, charged up as another service rendered . . . During the fire season alone, the service the telephone operators render far overshadows the efficiency of any automatic telephone system."

It is a tragedy of our business that automation must inevitably write "finis" to that sort of human service.

"Orbital Scatter"

THIS AGE of scientific renaissance is wonderful to live in, but hard on the nerves. No sooner do we half-digest the idea of some scientific miracle than it is suddenly outmoded before it leaves the experimental status.

Take world communication by satellites, f'rinstance. We read about Echo, the 100-foot balloon orbiting 1000 miles up. We tried to imagine a chain of 50 or more of them, all busy bouncing long distance messages from yon to hither at 25 cents a bounce. We even tried to visualize the U.S.I.T.A. Toll Settlement experts arguing with Bell System committees about the division of the spoil, as between Bell and Independent satellites.

Then comes W. E. Morrow, of Massachusetts Institute of Technology. He tells the International Scientific Radio Union in London all about M.I.T.'s "full scale technical development of orbital scatter." Apparently, we infer, satellites for communication will become merely a memory of a primitive past, like magneto 'phones, A-bombs and non-synthetic blondes. If M.I.T.'s ideas are successful, millions of "dipoles," tiny metallic fibers half an inch long and one-third as thick as a human hair, will be carried thousands of miles up in space. There this blanket of fuzz will orbit serenely around forever, bouncing back messages for the benefit of the communications industry. That is, unless the scientists think up something better than "orbital scatter" before the dipoles have a chance to show their stuff.

EDITOR'S NOTE

Publication of Part II of "The All-Buried Service Concept," by John S. Reed, will appear in the December 15 issue of TE&M.

"Tensegrity"

IN THE excitement of modern scientific achievements and new discoveries, from plastics to atom splitting, one tends to overlook some astonishing improvements in the making and doing of ordinary things. Yet even in the Space Age, Ralph Waldo Emerson's "better mousetrap" is still important.

Lattice towers were among the earliest of the building arts; one might imagine that their making was stabilized ages ago; yet the tower designed recently by Buckminster Fuller is revolutionary. Certainly it should interest our communications engineers with microwave antennae on their minds. Fuller has created what is described as an architectural mutation. His "tensegrity tower" utilizes the tensile, rather than the compressive, strength of its steel components. The result looks like a draftsman's nightmare, but it is reported to be far lighter and stronger than any tower of conventional design.

Facsimile Mail

POSTMASTER General Arthur E. Summerfield took time out from his hobby, that of looking after the nation's morals, to discuss facsimile mail service at the Michigan Independent Telephone Association convention. It will not be, he says, a governmental acquisition of communications services now furnished by private industry; the Post Office will "ask the established communications companies to provide the equipment to operate it."

Just what that may really mean is unimportant, for Mr. Summerfield qualified his remarks: ". . . at least as far as the present administration is concerned." What he said about private company participation might mean nothing whatever on January 2, 1961.

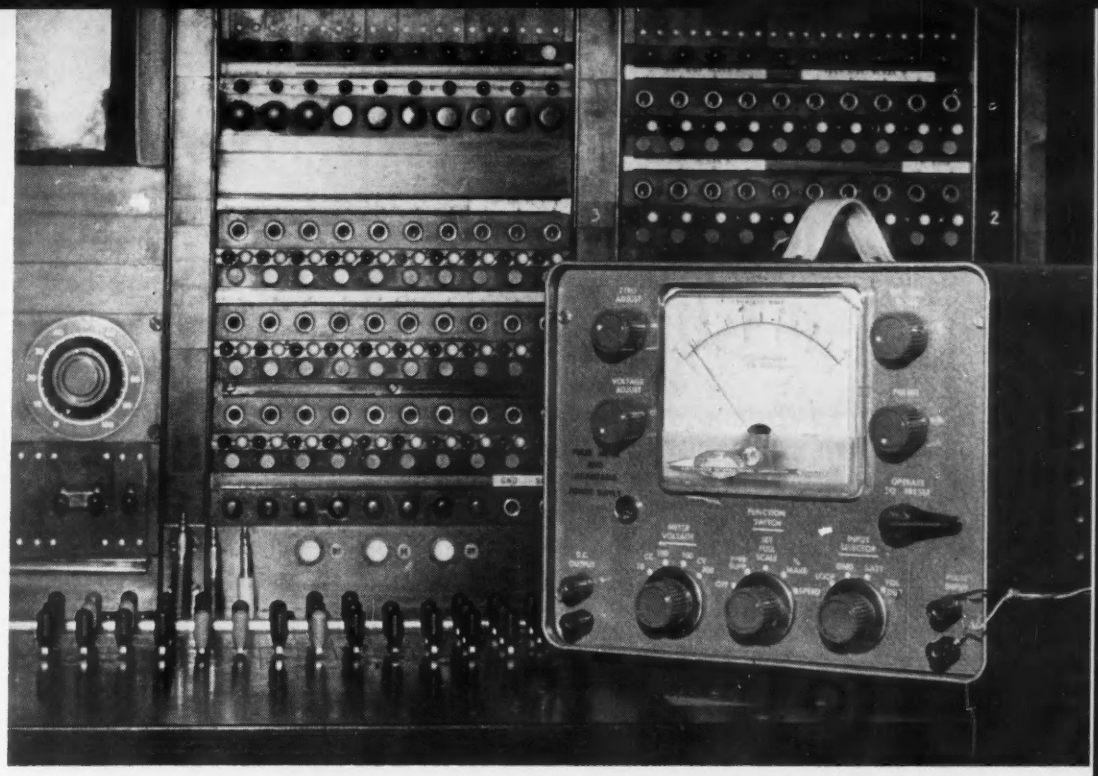
Unquestionably, facsimile mail will hurt our long distance revenues; and there is little reason at present to suppose that the smaller operating Independent telephone companies will be handed an adequate quid pro quo.

"CHARLIE" by Jim Counts

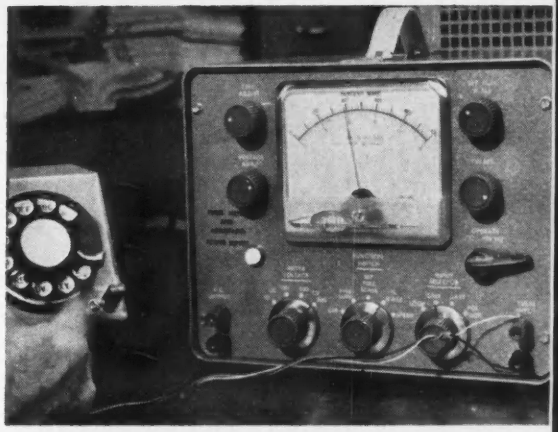
YA' KNOW, CHARLIE... LINEMEN AREN'T AS SHREWD AS THEY USED TO BE...
I CAN REMEMBER BACK WHEN I WUZ CLIMBING... WE USED TO GET ONE OF TH' MEN TO KEEP TH' FOREMAN OCCUPIED...
...WHILE TH' REST OF US SNEAKED OFF FOR A COKE!
10-15
Jim Counts

At Last!

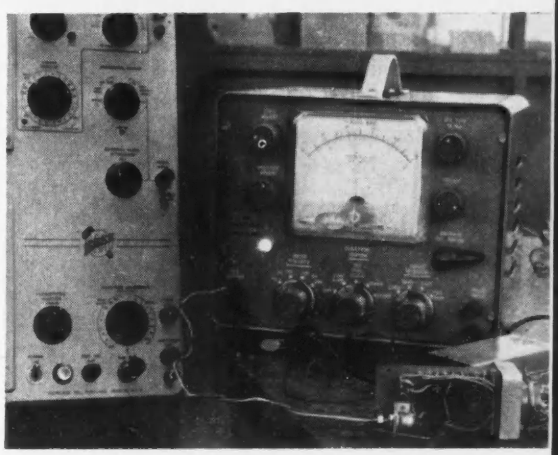
(someone did it)



A PULSE METER



that is compact, easily carried, and plugs into the nearest 115 volt, 60 cycle ac wall outlet. Developed by telephone men FOR telephone men, our new pulse meter and power supply measures dial pulses from 0 to 15 pulses per second and percent make from 0 to 100 percent. It will accept loop, ground, battery, carrier, and polar-duplex pulses. Simple in operation, it can be easily carried and used at the test board, the telephone instrument repair bench — any place in the telephone exchange. For that matter, it can easily be moved to the actual subscriber instrument if the need arises. As an added bonus, the PMVPS-1 also gives you a dc power supply continuously variable from 0 to 300 volts. Use it to check transistor circuits, vacuum tube circuits, as a standby power supply—the sky is the limit! Best of all, you will be surprised that so much can be purchased for such a low price!



AIRTRONICS INTERNATIONAL CORPORATION

P. O. Box 8576, Fort Lauderdale, Florida (6900 West Road 84)

other product FIRSTS from Airtronics:

Program Equalizers
Portable Test Hybrid Sets
Artificial Transmission Lines
Line Matching and Terminating Sets
Switch Gain Amplifiers
Pulse Meters
Transmission Measuring Sets

keeping up with COMMUNICATIONS

New communications system "hitches" as many as 100 conversations to a beam of light . . . New voice for the voiceless . . . New telephone system provides instantaneous two-way transmission of data.

Light-Transmission System

DEVELOPMENT of a communication system that "hitches" as many as 100 conversations to a beam of invisible ultra-violet light was announced last month by International Telephone & Telegraph Corp. Unlike earlier light-transmission systems, which use low-frequency waves and are limited to a single channel, the ITT development works with high frequencies and can handle many messages simultaneously.

A prototype model of this new, portable system was used October 20 at Providence, R. I., to inaugurate the country's first automated post office. Mrs. Arthur E. Summerfield, wife of the Postmaster General, spoke into the special microphone and directed the mail-processing machinery to begin operation. Her voice was transmuted to electronic impulses to turn on the equipment. Intelex Systems Inc., a subsidiary of ITT, is contractor for the postal facility.

Making up the equipment are a one-pound transmitter with an ultraviolet light bulb and a transistorized receiver weighing twice as much. According to engineers at ITT Laboratories, Nutley, N. J., where the new techniques are being pioneered, the bulb provides the rays of invisible light along which the message travels. A photo-multiplier tube in the receiver converts the light rays into electrical energy to produce the transmitted intelligence.

Depending on particular requirements, the units can handle almost any information from any source, including teleprinters, tape readers, computers, and voice and telemetry systems.

ITTL project engineer Frederick Beisel points out that "where a security problem exists, such as in military communications, invisible ultraviolet light can be transmitted to insure secrecy. The reliability, vital to military needs, is also safe-guarded since there is relatively little local interference, an obstacle to present short-range radio systems."

Possible military applications include use in air-to-air and air-to-ground, and ship-to-shore or fleet communications, where standard radio silence is mandatory.

ITTL Vice President Arnold M. Levine, under whose direction the development was carried out, calls the new device "a major step to secure, reliable short-range communications."

New Telephone System For Written Data

A SYSTEM that provides instantaneous two-way transmission of all kinds of business data as well as normal conversation over a single dial telephone circuit was introduced last month by the Digitronics Corp. According to the manufacturer, payroll, inventory and almost any other data may be sent for the price of a single telephone call at the rate of 9,000 characters, or 1,500 words, a minute.

Presently, the fastest way of sending such data is the far more expensive private telephone or telegraph leased wires, according to Eugene Leonard, Digitronics sales vice president, at from 360 to 600 characters a minute. The Digitronics system, called the *Dial-o-verter*, must have the American Telephone & Telegraph Co.'s Data-Phone attached to function. The Data-Phone takes punched or magnetic tape data processed by the *Dial-o-verter* and converts them into electronic impulses that may go over the dial telephone wire. At the receiving point, another Data-Phone "unscrambles" the electronic impulses, converting them back to tape by a Dial-o-verter receiving instrument. At any time, a button pressed on the Data-Phone permits switching from data transmission to normal, two-way conversation.

New Voice For The Voiceless

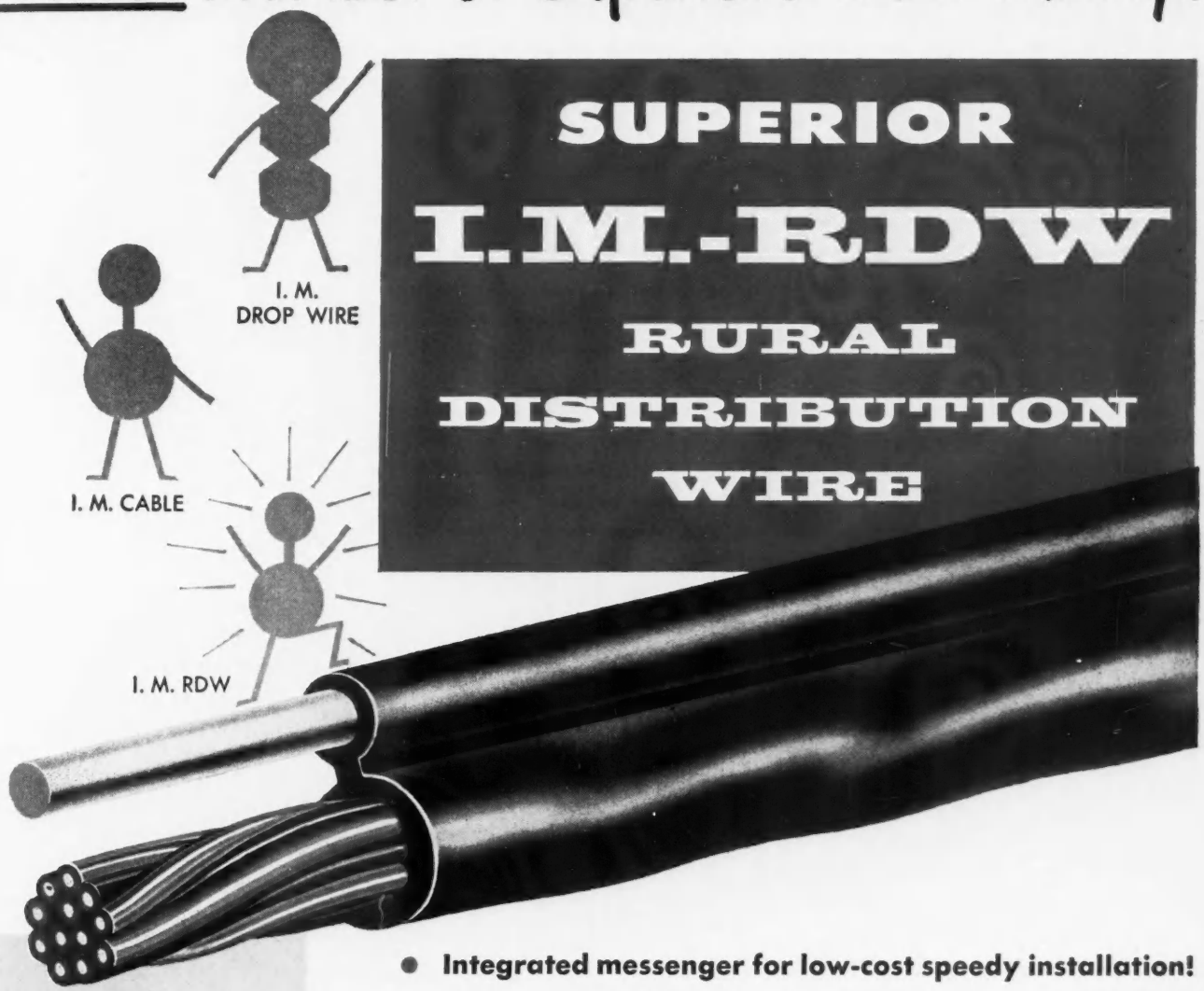
A NEW VOICE for the voiceless has been introduced by the Bell Telephone System.

Some 20,000 persons in the United States are without the power of speech as a result of paralysis or surgical removal of the larynx and must depend either on esophageal speech or an artificial larynx in order to talk.

The new device, an electronic larynx, will be made available on a non-profit basis by the Bell Telephone Companies. It resembles a streamlined electric shaver, contoured to fit the hand and designed to be held against the outside of the throat while being operated. It transmits sound waves into the throat cavity replacing those normally produced by air passing over the vocal cords. Speech is produced by forming words with the lips and tongue just as in normal conversation. Persons with speech handicaps have learned to use the instrument with a minimum of training and difficulty.

The electronic larynx is produced in two models, one high-pitched to simulate the female voice and the other with a lower pitch for men. Both are provided with a finger control which enables the user to vary the pitch of his voice over a half-octave range in order to produce more natural inflections of speech and emphasis on words or phrases. After practice, this control can be operated

Newest member of Superior's I. M. Family!



SUPERIOR I.M.-RDW RURAL DISTRIBUTION WIRE

- **Integrated messenger for low-cost speedy installation!**
- **Black polyethylene insulated conductors with inlaid color stripe* for fast pair identification!**
- **No special installation hardware required!**

Color-coding stripe of monofilament polyethylene, inlaid permanently in conductor insulation, won't flake off, scratch off or absorb moisture.*

SUPERIOR'S I. M. - RDW is a multi-pair distribution wire with a special high strength galvanized steel messenger incorporated as an integral part of the black, polyvinyl chloride jacket. Individual 19 gauge soft-drawn copper conductors are insulated with high-density black polyethylene. Superior electrical and weathering characteristics.

Order the newest member of SUPERIOR'S I. M. family . . . SUPERIOR I. M. - RDW . . . for subscriber line use or for the distribution of subscriber circuits from a main cable lead. Available one through eighteen pairs.

* *Pat. applied for*

For complete information and prices, write

SUPERIOR CABLE

SUPERIOR CABLE CORPORATION, HICKORY, NORTH CAROLINA

3469

"Keeping Up With Communications"

(Concluded from page 14)

with considerable speed, enabling the user to produce speech of considerable intelligibility and naturalness. Speech volume is equivalent to a normal talker speaking at a conversational level.

The device, developed by Bell Labs, uses Bell transistors and is powered by self-contained mercury batteries, sold in any radio store. Batteries last several months, depending on amount of use. Medical authorities, particularly the National Hospital for Speech Disorders, and larynx users themselves helped in the development of the instrument.

Information about the new larynx may be obtained at any Bell Telephone Business Office. Prospective buyers should see their doctors before buying a unit and concur in the use of the larynx. Sales representatives, specially selected and trained, have been appointed in each area to handle negotiations.

New Products & Services

PLANS for a whole new array of telephone services and products for the present and future were described by Frederick R. Kappel, president of the American Telephone and Telegraph Company last month.

Speaking before the Boston Conference on Distribution, Kappel cited:

- Pocket radiotelephones from which you can talk with anyone, anywhere;
- Satellite communications, including worldwide television;
- High-speed machine-to-machine "talk" over the regular telephone network.

"We have a strong feeling that in a few years' time data communications will actually exceed, in sheer volume, the communication of speech," Kappel said. "In the future, it is quite possible that trade publications, news bulletins, and even newspapers will be widely circulated over electrical circuits."

He noted that the era of machine-to-machine communications over the regular telephone network is already at hand through the use of Bell System Data-Phones, which "make it possible and practical for many types of business machines to 'talk' over telephone lines."

Kappel pointed out that use of the regular telephone network for machine-to-machine communication "makes possible a wonderful flexibility — a company's communication system can be expanded or modified almost at will."

He envisioned the development of a network "over which we shall be able to switch pictures, whole rivers of data, or what have you, between any two customers who have compatible equipment."

He cited as evidence of growing telephone versatility the fact that whereas Direct Distance Dialing, by which telephone users can dial their own long distance calls, is now enjoyed by about 20 million customers, it will be almost universal in a few years.

"Further," he said, "it appears to me that step by step, the distinction between 'local' and 'long distance' in communications will gradually disappear. We have already seen the broadening of local telephone calling areas, so that calls between many adjoining communities are not treated as toll calls. Not visionary, but extremely practical, is the concept that many of our customers will want forms of service enabling them to call over wide areas, and even across the continent, at a flat monthly rate."

On the future of mobile telephone services Kappel said that "eventually, it is altogether possible that you could carry a pocket radiotelephone enabling you to talk with anyone else, anywhere, any time."

"Let us say for example that a Boston wool merchant, on his way to visit a customer, might pause a moment to call Australia and check a few facts with an agent there who happened to be off on a camping trip."

In the field of faster calling, Kappel noted that in November an experimental Electronic Central Office will go into operation. It will enable calls to be switched in millionths of a second, instead of thousandths as in present equipment.

Kappel predicted overseas calls of the future would go not only via space satellites but through additional overseas cables as well.

Pointing out the necessity for both systems he said: "Whereas this year we shall be handling something less than 4 million overseas calls, 20 years hence we think the number may be around 100 million — more than 25 times as many."

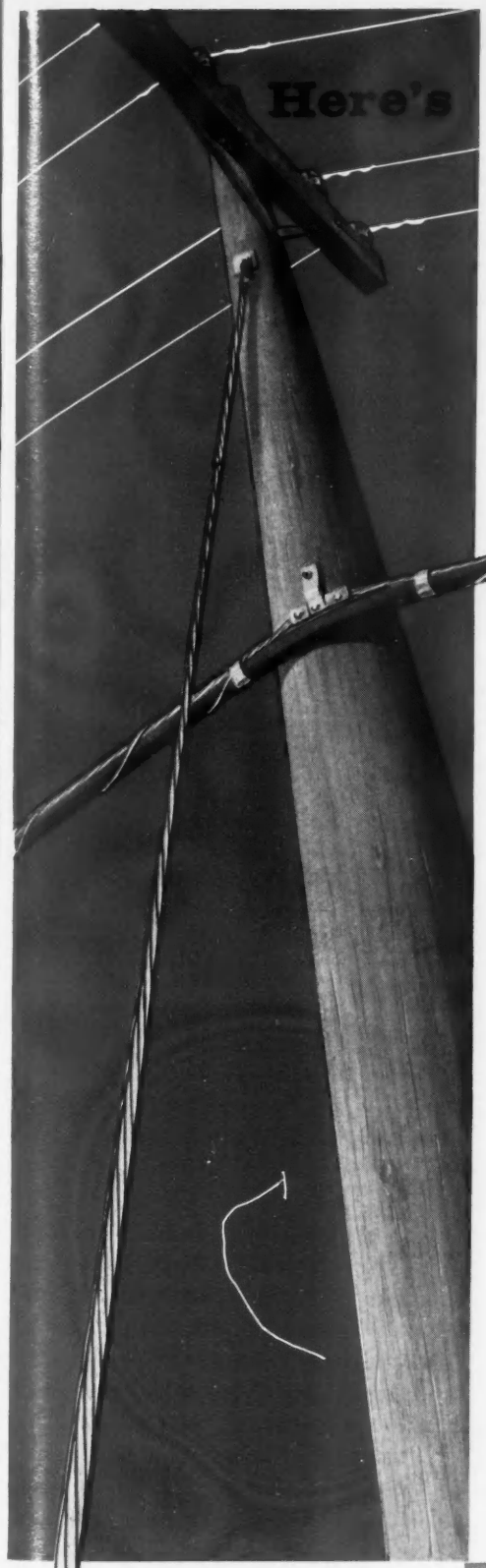
He cited the Bell System's plan for 50 satellites providing channels between various points all over the globe and said "We have increasing confidence that such a system will not only provide high-quality talking channels, but will also make worldwide television a practical reality."

850-Number Automatic Dialer

DIALAPHONE, a new automatic dialing device manufactured by the Dialaphone Corp., is now being market tested in Hartford, Conn., by The Southern New England Telephone Co. About the size of a 500 set, the *Dialaphone* enables the user to reach one of 850 pre-recorded numbers simply by pressing a lever, without dialing each of the seven digits.

The device consists of a directory tape, built-in perforator arrangement, selector crank for locating numbers, an alphabetical guide, and an operating lever. The directory tape, prepared for the telephone company by the manufacturer from a list furnished by the customer, shows the listing of the person to be called and includes perforated information which is decoded by the mechanism. The customer can add or change numbers by means of a punch mechanism built into the dialer.

To operate the *Dialaphone*, the user turns the selector crank on the side until the desired name appears in the view frame. He then lifts the telephone receiver and upon hearing the dial tone, presses the operating lever. The number then is automatically dialed.



PERMANENT SUPPORT

for your Poles

and Aerial Cables

ALUMOWELD®

guy and messenger strand

You can forget all about maintenance costs when you install Alumoweld Strand. This low-cost guy and messenger strand is designed to last as long as the pole it guys or the cable it supports.

A thick cladding of pure aluminum gives Alumoweld the same high resistance to corrosion as solid aluminum. This protective aluminum covering, which will never crack, flake or peel, is inseparably welded to the steel core by the unique controlled atomic-welding process. As a result, the strong steel core is constantly protected against corrosive attack and its original high strength is permanently maintained.

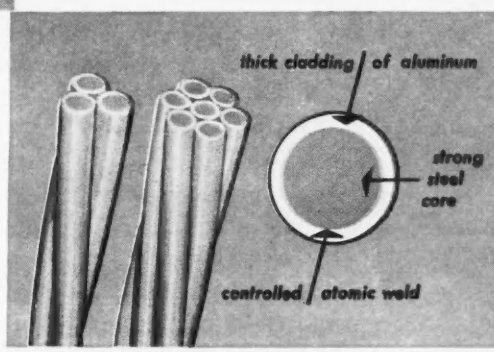
Alumoweld is as strong as steel. And its light weight—18% less than steel of comparable diameter—makes it easier to handle, easier to install.

Supplies of Alumoweld Guy and Messenger Strand are available for prompt shipment to you from our warehouses in New York, Chicago, Pittsburgh and Memphis.

COPPERWELD STEEL COMPANY

WIRE AND CABLE DIVISION Glassport, Pa.

For Export: COPPERWELD STEEL INTERNATIONAL COMPANY, New York



Alumoweld's thick aluminum covering—25% by area—is applied by an entirely new cladding process—the controlled atomic weld. For complete information on Alumoweld Strand, write for Engineering Bulletin E.D. 3000.

THE WASHINGTON BEAT

By ROLAND DAVIES and FRED HENCK

WASHINGTON OBSERVATIONS

Space Communications

DESPITE the action of the Federal Communications Commission in deferring until some future date the setting aside of frequency bands for satellite communications operations, the possibility of commercial communications operations by a satellite system appears to be getting closer.

In one of the latest developments, the American Telephone & Telegraph Co. Long Lines Department has filed an application with the FCC seeking approval of a satellite experiment, and asking for rule changes which would allow the company to proceed, following satisfactory tests, with the initial stages of commercial service.

AT&T said it was prepared to put the first station of a satellite relay system into space within a year, to provide for the experimental transmission of telephone calls, television, data transmission, and other types of communications between the United States, the United Kingdom, and continental Europe.

The company filed a petition for an amendment of the FCC rules to allocate frequencies for space communications "in order that we may initiate a communication service from this country to Western Europe and the United Kingdom via active satellies. Although the frequencies requested herewith are also included in the band in the petition, there is no intention to establish commercial service under the research experimental authorization. It is planned to file application for commercial service at a later date," AT&T Vice President H. T. Killingsworth, in charge of the Long Lines Department, declared.

AT&T said it is now prepared to contract for the launching of the necessary satellite and to proceed with the construction of transmitting and receiving stations on the ground. The project would be financed and the facilities operated by AT&T, in coordination with the telephone administrations in the various countries abroad in the same manner as in providing overseas communications by cable and radio.

"We are planning a system that would make use of solar-powered satellites orbiting at an altitude of about 2200 miles," Mr. Killingsworth said. "Electronic amplifiers aboard the space station would catch signals from earth, immediately boost and relay them on to ground stations in the U.S., the U.K., and Western Europe."

No estimate was placed on the cost of launching the first such satellite, but an AT&T spokesman said that later satellites put into orbit would cost an average of $1,000,000 each.

Mr. Killingsworth pointed out that "We expect this initial satellite will be capable of transmitting up to about 35 minutes some three or four times a day — coordinated with the satellite passes over the earth station areas. The satellites would act as microwave towers in the sky, performing the same boosting and transmitting functions as the microwave towers of our radio relay systems here on the ground."

It was noted that "Bell scientists and engineers expect satellite communications will help answer a rapidly growing demand for circuits between the United States and other countries. Overseas calls this year will total some 4,000,000, double the number handled five years ago. AT&T estimates the number may be around 100,000,000 twenty years from now."

The AT&T application came a few days after the federal government's space agency chief, T. Keith Glennan, National Aeronautics & Space Administrator, declared in a speech that the use of satellites to provide communications links as a part of commercial services should be left to private industry. The government, he declared, should lend assistance aimed at accelerating the nation's progress toward the practical application of such communications systems.

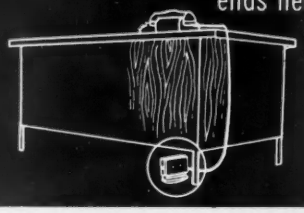
Mr. Glennan remarked that "The utilization of satellites to provide communications links as a part of ordinary commercial services may involve, in the not too distant future, the first non-governmental activity in outer space.

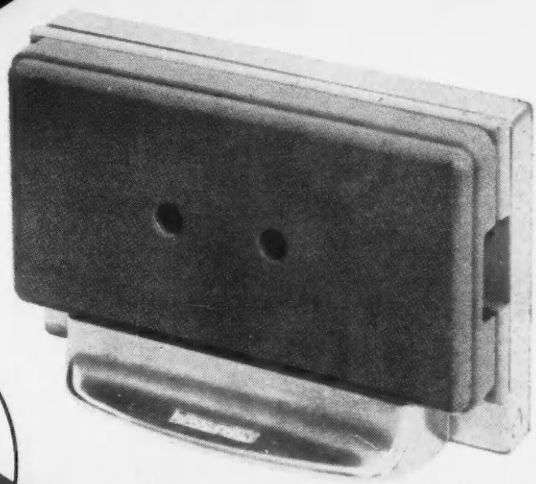
"Traditionally, communications services in this country have been provided by privately financed carriers competing with one another to serve the public interest under federal controls and regulations," he said. "There seems to be no reason to change that policy with the advent of communications satellites. It is clear, however, that such activities involving the launching of vehicles into outer space must be regulated in the public interest, even during the stages of developmental testing."

Mr. Glennan spelled out these guidelines: "NASA's efforts to realize the promise of space technology in the communications satellite field will be accelerated but they will not be conceived as a 'crash' program, nor will they duplicate well-conceived activi-

FLOOR-CON TELEPHONE FLOOR CONNECTOR

keeps desks free from all telephone equipment . . .
ends needless marring of office furniture





gives you beauty, uniformity and economy!

Floor-Con allows all telephone installation work to be completed in advance of moving. All wiring is concealed. Approved and specified by telephone companies, Floor-Con is used exclusively in many large buildings in business, industry and government. Floor-Con attaches to all types of underfloor duct systems, flush type floor boxes, single conduits, through the floor—or if conduits are not provided, screws directly to the floor.

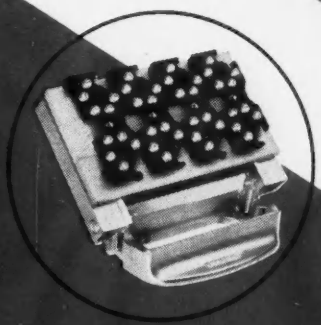
Comes in four plated finishes: Chrome—satin or bright, and Brass—satin or bright.

All necessary fittings will be supplied to adapt Floor-Con to your particular duct system or floor installation—please specify the type or make in use.

MODEL 104 shown with standard telephone equipment, accommodates up to 8 No. 40-A Connecting Terminals (4 on each side).

MODEL 102 accommodates up to 6 No. 44-A Connecting Terminals (3 on each side).

Or, the back of either model can be used to install external ringers, buzzers or auxiliary equipment.



(Pat. No. 2854166)

For catalog information and prices, write:

FLOOR-CON Dept. - TM
759 North Spring Street / Los Angeles 12,
California / Telephone: MAdison 4-5400

If you want maximum service Specify T-C Pressure-Treated Poles

. . . Then rest assured *you* have poles with the best in preservation. Here's why . . . each step in our production is subject to precise and accurate control, timber selection, manufacture, moisture removal and treatment. And, only the finest chemical preservatives are used. You get uniform high quality, the best in preservation and maximum service with the T-C brand on your poles.

Specify T-C

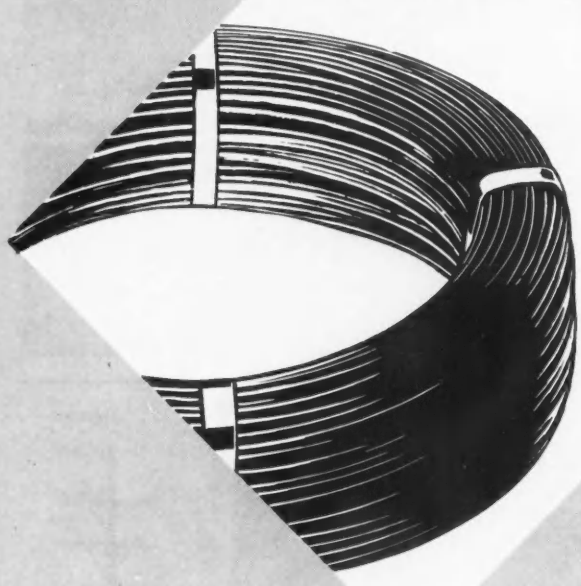
DISTRIBUTED BY AUTOMATIC ELECTRIC SALES CORP. AND LEICH SALES CORP.

TAYLOR-COLQUITT CO. TIMBER CONSERVATION T-C

TAYLOR - COLQUITT CO.
SPARTANBURG, SOUTH CAROLINA

PLANTS AT SPARTANBURG, SOUTH CAROLINA AND WILMINGTON, NORTH CAROLINA

YOU KNOW IT'S FRESH



when you buy

ALPHADUCT

DATED DROP WIRE

You can see at a glance *when* Alphaduct Dated Drop Wire was manufactured. There's no need to take a chance on purchasing drop wire that has been stored for years. No need to keep installation date records. And, Alphaduct gives you five other big advantages:

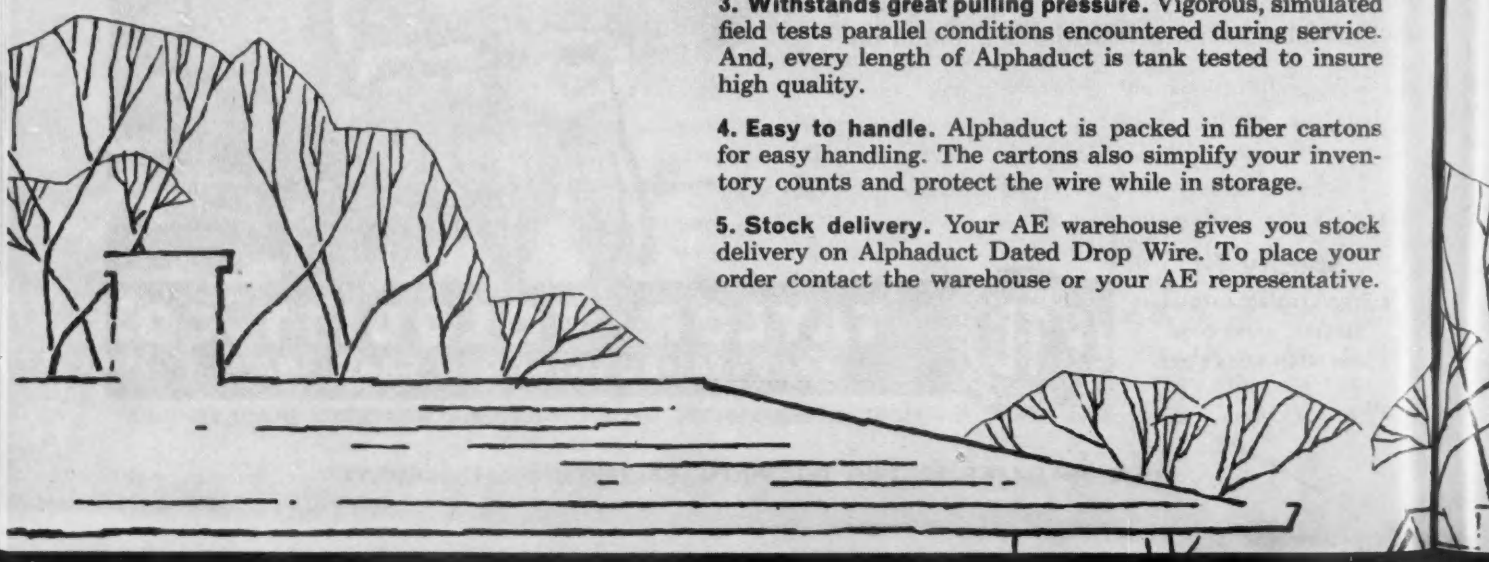
1. High resistance to deterioration. The neoprene jacket offers high resistance to abrasion, temperature, sun, oil, grease, acid, alkalis, fire and humidity.

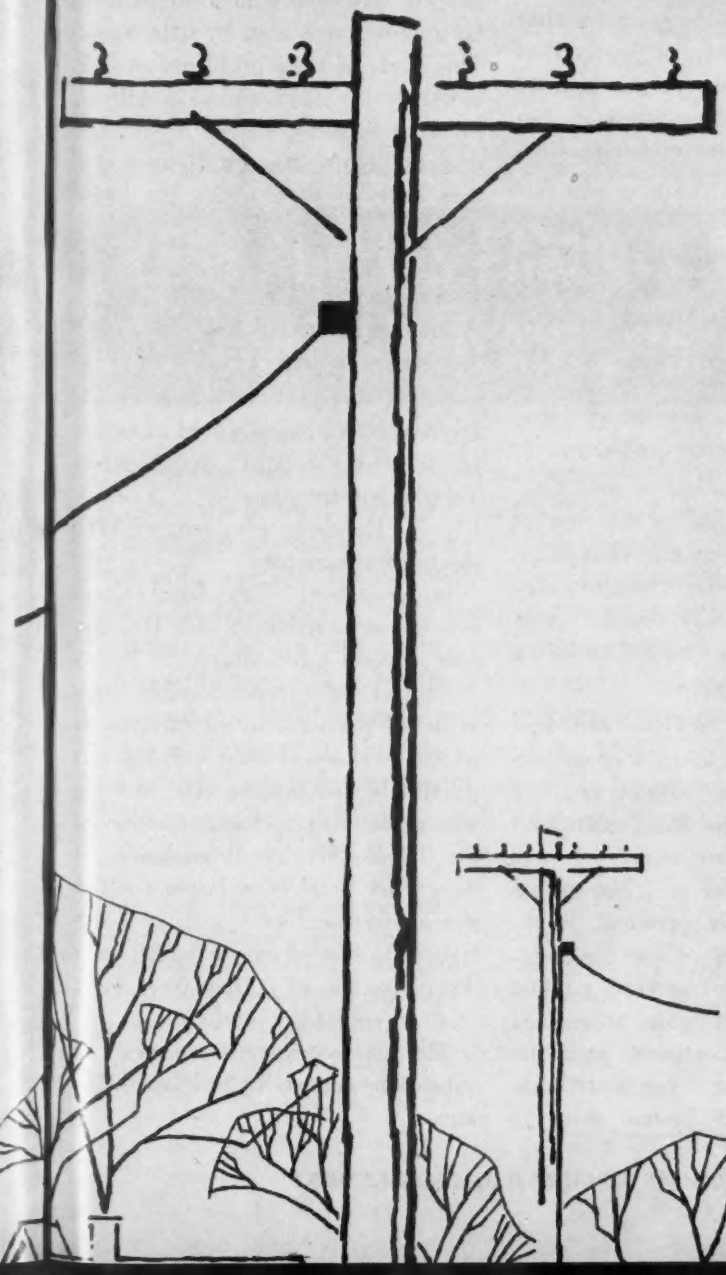
2. Best balance. Alphaduct's rubber insulation gives the best balance of physical and electrical properties and long life for communication service.

3. Withstands great pulling pressure. Vigorous, simulated field tests parallel conditions encountered during service. And, every length of Alphaduct is tank tested to insure high quality.

4. Easy to handle. Alphaduct is packed in fiber cartons for easy handling. The cartons also simplify your inventory counts and protect the wire while in storage.

5. Stock delivery. Your AE warehouse gives you stock delivery on Alphaduct Dated Drop Wire. To place your order contact the warehouse or your AE representative.





New Alphaduct Telephone Wire Catalog

You'll find full information and specifications on all Alphaduct insulated telephone wire in Alphaduct's new catalog. For your free copy, write: *Automatic Electric Sales Corporation, Northlake, Illinois.*

warehouses:

Northlake,
Illinois
Fillmore 5-7111

2915 Moore St.
Richmond 21, Va.
ELgin 8-9280

2360 N. W. Quimby St.
Portland 10, Ore.
CApital 3-7244

158 Corliss Avenue
Johnson City, N. Y.
SWarthmore 7-8507

2021 Main St.
Kansas City 8, Mo.
HArrison 1-7575

AUTOMATIC ELECTRIC

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

Washington Observations

(Concluded from page 18)

ties of the military or the commercial projects of private companies. NASA's efforts will proceed technically along a sufficiently broad front to assure the objective of achieving a system capable of practical application. Finally, NASA will continue its research and development efforts in this field only so long as is necessary to assure that timely development of a commercially feasible communications system will be completed by private industry."

Although the AT&T proposal is the only one formally before a federal agency at this point, there have been reports that the International Telephone & Telegraph Corp. may soon make a concrete proposal for satellite communications tests. One of the same reports also mentioned the Martin Co., aircraft manufacturer, as a possible competitor in this field.

Telephone Separations

ANY LIKELIHOOD of an early telephone separations change which would shift some of the present intrastate revenue requirements into the interstate pot, thus giving state commissions another crack at reducing existing state-interstate toll rate disparities, apparently went out the window at a meeting in Washington between the Federal Communications Commission's Telephone Committee and the Special Telephone Committee of the National Association of Railroad & Utilities Commissioners.

The NARUC group sought the meeting as a consequence of a resolution adopted at last year's NARUC convention, which directed the Special Telephone Committee to explore avenues toward revisions in the existing separations procedures. Subsequently, there had been meetings on a staff level, and the late-October session in Washington was intended as the culmination of the program prior to this year's NARUC convention, scheduled to start Nov. 28.

Earlier, the "full Phoenix" separations plan had been pretty well discarded. The Washington meeting pretty well put the kiss of death on the circuit mile and message-minute-mile plans, which were the other two mentioned in last year's NARUC resolution as giving some promise of leading toward reduction of the toll rate disparities which now exist.

While not flatly rejecting the recommendations of the NARUC group that serious consideration be given to the circuit mile and message-minute-mile plans, the FCC spokesmen made it clear that they "have serious problems" with the two proposals, and there appeared to be virtually no chance that the Commission would go along with the adoption of either plan in the foreseeable future.

Instead, it seemed likely that future consideration by FCC and NARUC representatives will be given to other possible refinements in separations procedures, possibly in the area of the interexchange component but more likely in the exchange component area.

Discussions at the meeting and in written material distributed about the two separations plans emphasized the problem of interstate-state toll rate disparities, and it was felt that the FCC must take into account the disparity problem in any future interstate rate actions or proceedings.

Overriding the whole picture, however, and giving rise to the view of observers that substantive changes in separations and related matters may be some distance away, was the potential impact of new services projected by the Bell System.

For example, AT&T President Frederick R. Kappel in a recent address declared that "step by step, the distinction between 'local' and 'long distance' in communications will gradually disappear . . . Not visionary, but extremely practical, is the concept that many of our customers will want forms of service enabling them to call over wide areas, and even across the continent, at a flat monthly rate. And if you should ask, 'When is the Bell System going to develop specific plans for this sort of thing?' I am happy to give you this answer: We are working on them now."

In the same talk, Mr. Kappel forecast that "in a few years' time, data communications . . . will actually exceed, in sheer volume, the communication of speech."

There appears to be strong basis for the viewpoint that it would be premature to make major changes in the nation's interstate telephone cost, investment, and revenue apportionments until the impact of the new service proposals, the accompanying program of competing with private systems, and the effect of the wide-scale private microwave systems now potentially authorized by the FCC are reviewed and considered.

In general, the difficulties outlined with the message-minute-mile and circuit miles stem from their use of national averages which would then be applied on a state-by-state basis. This leads to legal problems as well as regulatory philosophical questions, involved in going outside a jurisdiction to obtain average figures and then applying them within the jurisdiction.

Independent Tel. Corp. Acquires Control Of Jasper-Steuben Tel.

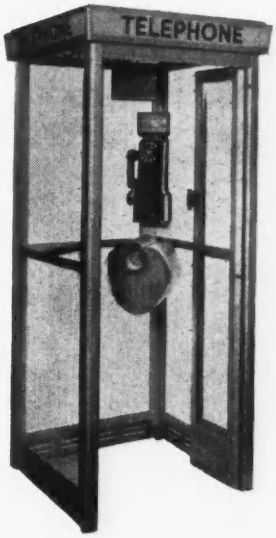
INDEPENDENT Telephone Corp., Dryden, N. Y., has acquired in excess of 80% of the stock of Jasper-Steuben Telephone Corp., Jasper, N. Y., William B. Harrison, president of ITC, disclosed last month.

Jasper-Steuben Telephone Corp. was formerly affiliated with ITC and now becomes a subsidiary.

Control of Jasper-Steuben was achieved pursuant to an offering to purchase shares owned by that corporation's stockholders. The offering was made with the authorization of the Public Service Commission of New York State. The Jasper-Steuben Telephone Corp. services an area contiguous to that served by the Allegany Telephone Co. of Alfred, New York, another subsidiary of ITC.

The ITC system now comprises 11 subsidiary companies and four affiliates.

PROUD of the BEST in engineering



Simplicity of design, good proportions, plus the use of strong, durable materials results in a product with both attractive appearance and a rugged constitution.

the BN Booth

For full particulars, consult your distributor or write direct ...
Benner-Nawman, Inc., 3421 Hollis Street, Oakland 8, California.

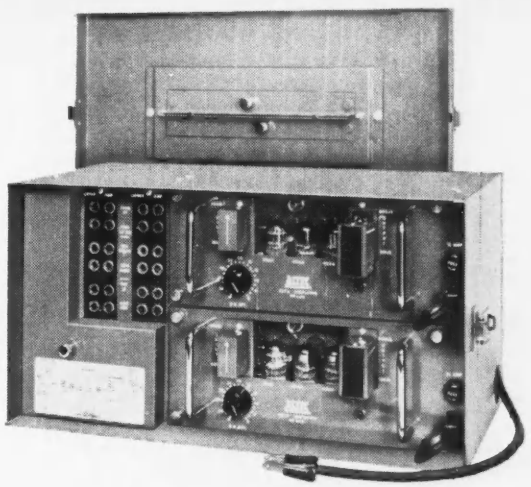
a B-N booth is a busy booth!

YES! ALTEC'S FAMOUS S-17 AMPLIFIER SYSTEMS ARE AVAILABLE *for immediate delivery!*

©1960 Altec Lansing Corporation

Rumors notwithstanding, the plain facts are that the famous S-17 Amplifier is not in short supply. Altec can meet your delivery date promptly on this justly popular system. The S-17 Amplifier has earned its reputation—for it was designed and engineered to provide the highest quality program transmission over telephone circuits. Its single cabinet housing is portable and rack-mountable. It contains two program-quality 437B Amplifiers, two 17224 Equalizers and two jack fields to facilitate testing, equalizing and monitoring. Two complete circuits can be maintained without cross-talk.

Amplifier specifications include:
Output power: +24 dbm
Distortion: not over ½% THD (40-15,000 CPS at +24 dbm)
Gain: at least 44 db, adjustable to 8 db minimum
Gain Adjustment: 2 db steps and 1½ db vernier
Frequency response: ±1 db, 20-20,000 CPS
Equiv. input noise: −115 dbm



For complete information about ALTEC telephone and paging equipment write to address below or call PRospect 4-2900 in Anaheim.

CALL OR WRITE TODAY

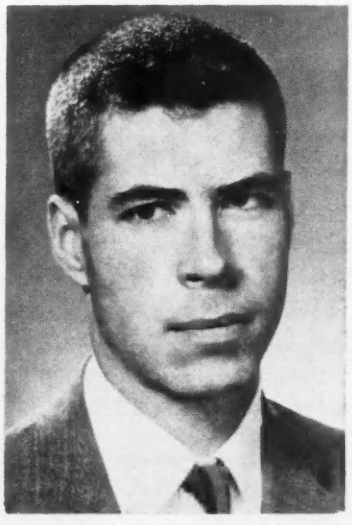
ALTEC LANSING CORPORATION
DEPT. TE-11D
A subsidiary of Ling-Temco Electronics, Inc.
1515 S. Manchester Ave., Anaheim, California
161 Sixth Avenue, New York 13, New York

INDUSTRY VIEWS

RICHARD P. WARNE, installer, Mansfield (Ohio) Telephone Co.; Mr. and Mrs. ROBERT MEESE, 597 Woodland Rd., Mansfield, and their family (DAVID, JANE, DEBBIE, and MARILYN) are watching an historic occasion — the installation of Ohio's 4,000,000th telephone, in their home. The telephone installed was the Starlite, a new light-weight instrument, bearing a gold plate reading, "The Four Millionth Telephone in Ohio, Installed in Mansfield, Ohio, Oct. 6, 1960." Mansfield's service started only four years after Alexander Graham Bell invented the telephone. The first telephone in Ohio was installed in Cleveland on June 25, 1887 and the first telephone exchange was placed in service at Cincinnati on September 1, 1878.

New Tennessee Telephone Association officers for 1960-61 (left to right) are: W. S. HOWARD, Millington Telephone Co., secretary-treasurer; JOHN E. SEXTON, Inter-Mountain Telephone Co., first vice president; N. V. FERGUSON, West Tennessee Telephone Co., president; M. V. WILLIAMS, Crocket Telephone Co., second vice president; and RANDEL S. BURNS, Bledsoe Telephone Cooperative, third vice president.

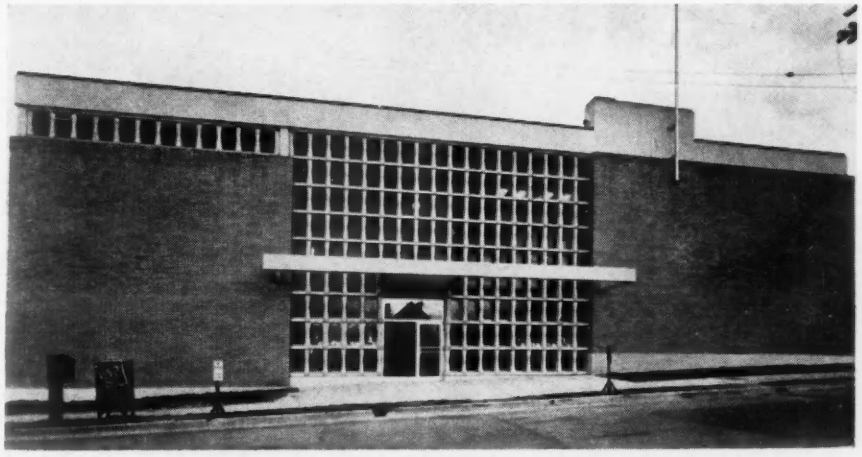
KENNETH J. JOHNSON has been appointed western region manager of ITT Kellogg to succeed Thomas R. Smith, who has been appointed manager of the newly created Hawaiian region. From headquarters at Burlingame, Calif. Johnson will direct ITT Kellogg commercial sales in seven western states and Alaska. Johnson has had broad experience in sales to the telephone industry. He joins ITT Kellogg after six years with Stromberg-Carlson. He previously was employed by Leich Sales Corp. as Los Angeles branch manager.



Motorola has named ROBERT H. DAVIS as chief engineer of its Microwave Department. In this capacity, he is responsible for microwave product development, systems engineering and field engineering.

Members of this Tennessee convention group are (left to right): OZLE ALLEN, MRS. WILLIAM S. SLUSHER and WILLIAM S. SLUSHER, former president of the Tennessee Telephone Association. Slusher and Allen are with the Ben Lomand Telephone Cooperative in McMinnville, Tennessee.

N. V. FERGUSON of the West Tennessee Telephone Co. and newly elected president of the Tennessee Telephone Association, left, receives the congratulations of outgoing president E. D. HILDRETH, manager of the DeKalb Telephone Cooperative, Alexandria.



Glass block grill work and buff brick finish make an attractive facade for British Columbia Telephone Co.'s newest dial office in Vancouver. The $200,000 Alpine exchange building contains 7210 sq. ft. and has 102 ft. of frontage. British Columbia Telephone, an affiliate of the General Telephone System, provides service for 505,000 telephones and forms the westernmost link of the vast coast-to-coast microwave network of the Trans-Canada Telephone System.

M. D. DIAL has been appointed sales engineer for the eastern part of Texas, state of Louisiana, and the southern part of Mississippi for the Reliable Electric Co. He will headquarter in Lufkin, Texas and report to District Manager Wallace Johnson.

NEWTON H. TUTHILL has been named president of the Bishop Manufacturing Corp., Cedar Grove, N. J., and its subsidiary, the Peters Manufacturing Co. Before coming to Bishop, Tuthill was vice president of the Amerace Corp. and president of American Hard Rubber Co. of Butler, N. J., a subsidiary. In 1937, he joined American Hard Rubber, molders, extruders, and calenderers of hard rubber and plastics, and custom compounders for consumer and industrial markets. In 1954, he became executive vice president and general manager of its wholly owned subsidiary, the Pequanoc Rubber Co., reclaim and custom compounding manufacturers. He was named vice president of Amerace and president of American Hard Rubber in 1957.

IS ELEVE
11
6
22
5
33
4
55
2

VE/OUR LUCKY NUMBER TOO?

yes...with North NX-2 crossbar for smaller exchanges

But there's no gamble involved, as you'll discover when you check the "Big 11" advantages of NORTH NX-2 CROSSBAR.

1. New Modular Design—permits easy and inexpensive expansion in 30 line multiples.

2. New Transistorized Trans-O-Ring Number Group—offers the advantage of permanent directory number assignment with no restriction. Single wire control affords full flexibility in relocating lines. Only one wire to move in the Trans-O-Ring number group to relocate any number.

3. Frequency Per Terminal with Terminal Per Station.

4. Traffic Load Distribution Flexibility—only with the crossbar number group can any subscriber number be assigned to any connector terminal. This allows full flexibility in distributing traffic loads **without changing numbers.**

5. 100% Automatic Intercept—for both toll and local calls.

6. Register-Sender With Translation Optional—for tandem offices wherever alternate coding or routing is required or desirable.

7. 100% Line Lock-Out—standard on all North crossbar switchboards.

8. Consecutive Number Assignments for PBX Lines Unnecessary—eliminates numbered line reserve problems.

9. Automatic Reverting Call Identification—requires no special code or operator intercept. Switching equipment automatically recognizes this call.

10. Minimum Maintenance—virtually no moving parts to wear or service. Crossbar eliminates the heavy mechanical wear that is inherent in motor-driven or stepping-type switches.

11. Designed For Today—And Tomorrow—accommodates all modern equipment including toll ticketing and multi-frequency signaling on toll as well as local lines. Adaptable to the electronic equipment of the future.

Whether you're planning expansion or cutover, North NX-2 means unparalleled small office (30 to 3,000 lines) efficiency.

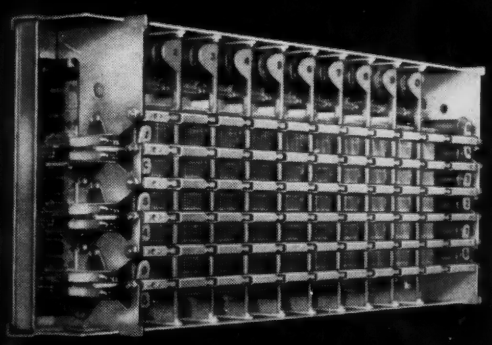
For full details, write, wire or phone

THE DYNAMIC FORCE IN THE TELEPHONE INDUSTRY

NORTH ELECTRIC COMPANY

Galion, Ohio

NORTH



60-T-5

Costs go down

as Stromberg-Carlson repeaters go up

On trunks and long lines, 100% transistorized "541" negative impedance repeaters assure maximum transmission quality . . . at low cost.

On existing installations you can often meet DDD requirements without replacing cable. In new installations you can get extra savings by using smaller gauge cable or wire.

On circuits with high transmission loss, Stromberg-Carlson's "551" hybrid-type repeaters can provide the gain you need to achieve toll standards. Initial cost is low; centralized maintenance means additional economy in man-hours saved.

For *in-use* proof of savings in actual *db* per dollar, contact the Stromberg-Carlson representative in your area now.

In Atlanta call TRinity 5-7467; in Chicago STate 2-4235; in Kansas City HArrison 1-6618; in Rochester HUbbard 2-2200; in San Francisco OXford 7-3630.

STROMBERG-CARLSON
A DIVISION OF **GENERAL DYNAMICS**

"Let's wait till the ice melts

IT SHOULD SNAP RIGHT BACK"

He's right—USS Tiger Brand Amertel 195 is an extra-high-strength telephone wire. It has been known to stand severe icing conditions without breaking, and service was not disrupted. When the ice melted, the wire, for all practical purposes, went back to its original stringing sag.

Amertel 195 has other important advantages, too:

- Longer spans, fewer poles mean lowest installation costs.
- Lower resistivity assures improved voice transmission, even at relatively high frequencies.
- Streams, gullies, valleys can be strung easily and economically.

Our new "Amertel 195" booklet will give you the complete story. Write American Steel & Wire, Dept. 0419, 614 Superior Ave., N.W., Cleveland 13, Ohio.

USS, Tiger Brand, Amertel are registered trademarks

American Steel & Wire Division of United States Steel

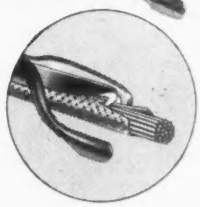
Columbia-Geneva Steel Division, San Francisco
Tennessee Coal & Iron Division, Fairfield, Ala.
United States Steel Export Company

Slit and Cut Cable Sheath Fast and Easy!

Neuses Cable Tools

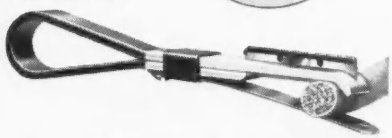
CABLE SHEATH SLITTER

No. N-62267



Just the tool needed for slitting most of the outdoor, heavy-duty types of cable coverings — large or small diameters.
Cuts into cable jacket at any point without previous notching. Size 6"x 1½". Price with 2 blades $4.20.

RING CUTTING CABLE TOOL



No. N-2060

A real handy tool for "ring" cutting the sheathing of INSIDE TYPE plastic, fabric, or rubber covered cable 3/16" to ½", or thin sheathed cable up to 1" diameter. Cut through cable sheathing *limited* to 1/32". Price $7.40.

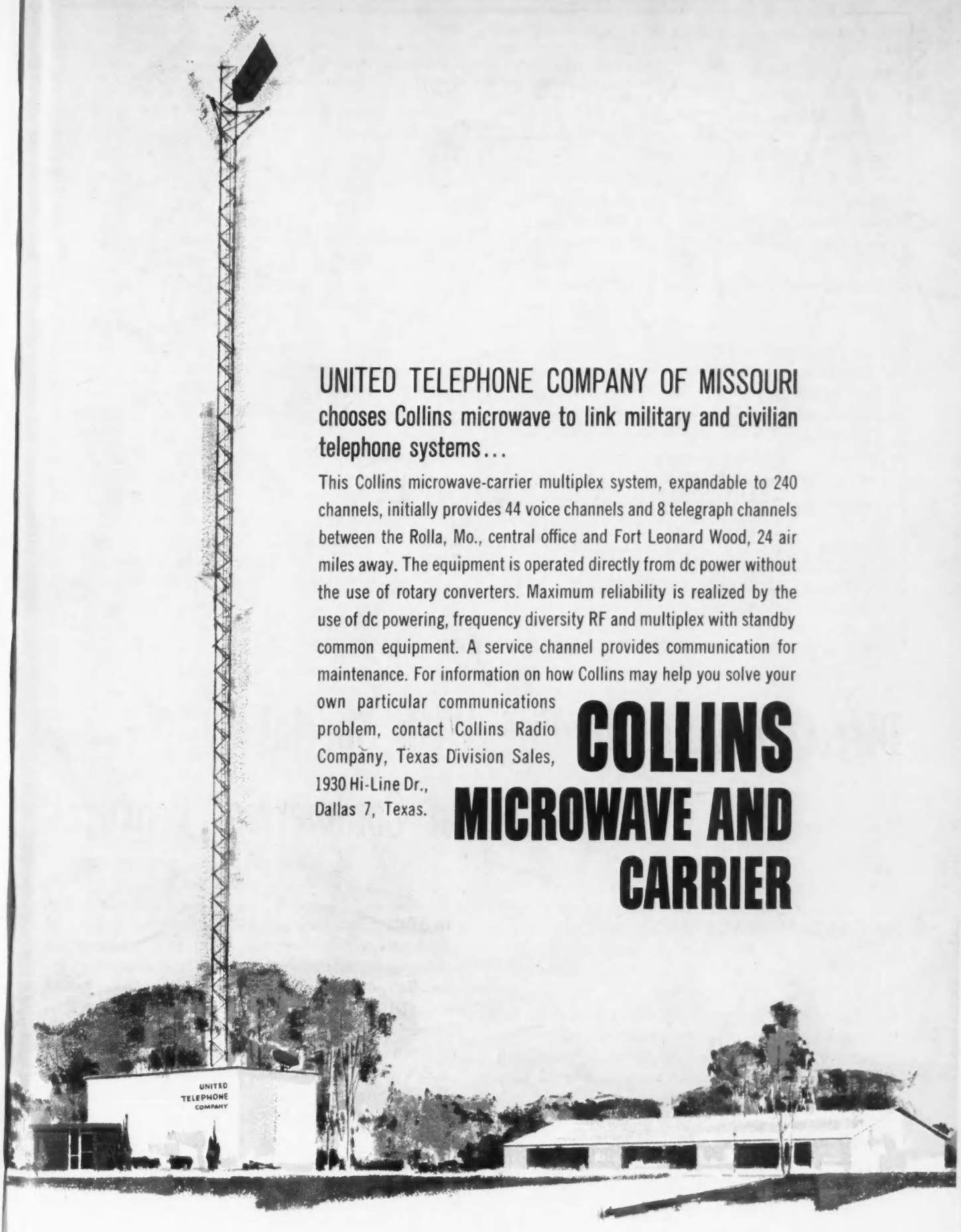
Order direct or write.

P. K. NEUSES, INC.
Small Tools for the Communication Industry.

511-21 N. DWYER ST. ● ARLINGTON HEIGHTS, ILL.

A Directory for the
United Telephone Company of Indiana, Inc.

Printed by
R. R. Donnelley & Sons Company
350 East Twenty-second Street, Chicago 16



UNITED TELEPHONE COMPANY OF MISSOURI

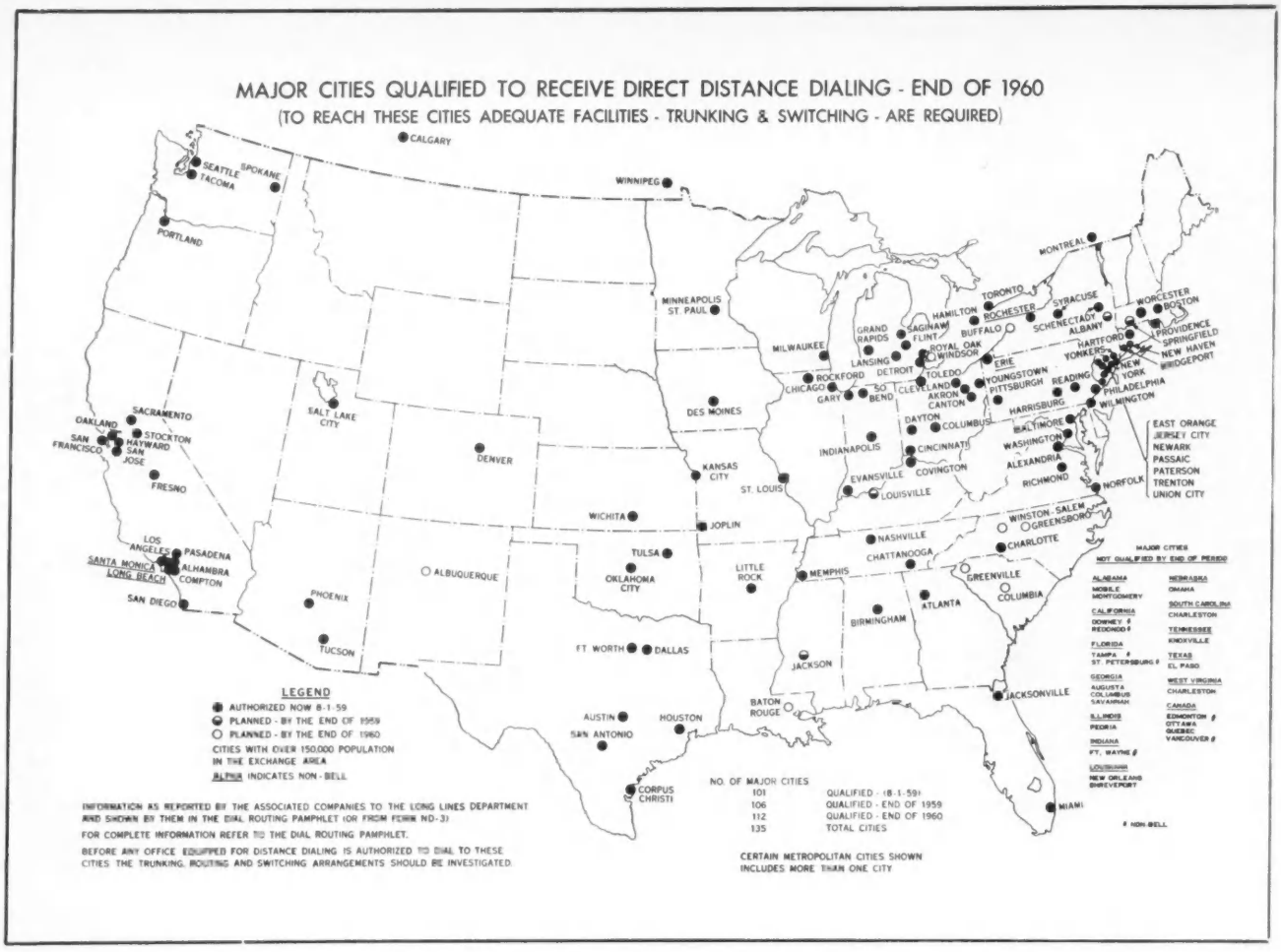
chooses Collins microwave to link military and civilian telephone systems...

This Collins microwave-carrier multiplex system, expandable to 240 channels, initially provides 44 voice channels and 8 telegraph channels between the Rolla, Mo., central office and Fort Leonard Wood, 24 air miles away. The equipment is operated directly from dc power without the use of rotary converters. Maximum reliability is realized by the use of dc powering, frequency diversity RF and multiplex with standby common equipment. A service channel provides communication for maintenance. For information on how Collins may help you solve your own particular communications problem, contact Collins Radio Company, Texas Division Sales, 1930 Hi-Line Dr., Dallas 7, Texas.

COLLINS MICROWAVE AND CARRIER

COLLINS

COLLINS RADIO COMPANY • DALLAS, TEXAS • CEDAR RAPIDS, IOWA • BURBANK, CALIFORNIA



Direct Distance Dialing With Special Emphasis On Commercial Features

By PAUL H. KAUFMAN*

SINCE our presentation is actually a case history it seems appropriate to present a few background facts concerning our experience with Direct Distance Dialing. I do hope you will pardon my pride when I relate the accomplishments which have been made in this field by the company with which I have had the pleasure to be associated for a good many years.

Northern Ohio Telephone Co. has been one of the leaders in this ultra-modern telephone service. Our first installation was made more than three years ago, and I might say parenthetically, there were not many in existence in the Independent industry at that time. This installation, which was made at Medina, Ohio, was of the BD type and at that time served 16,000 stations through seven exchanges.

It was an entirely new installation — new exchange building and new central office equipment included SATT equipment. On August 7 of this year we added another one of our toll centers to the network of Direct Distance Dialing. The last group included Norwalk, Ohio, and ten additional exchanges serving approximately 23,000 telephones.

To provide the new service in this case we recovered building space previously rented to others to gain additional floor space and added the SATT equipment and additional trunks between our tributary exchanges.

Mr. Kaufman, director of public information, Northern Ohio Telephone Co., Bellevue, presented this paper at USITA's 1960 Commercial Conference.

A third toll center is now being readied and present plans call for the inauguration of Direct Distance Dialing for five additional exchanges early in 1961.

At present 19 exchanges with approximately 39 per cent of our 117,000 stations are provided with this latest marvel of communications — Direct Distance Dialing and so we feel that we have every right to be proud of our progress in this field.

Subscriber Education

THE program of subscriber education in connection with this new service is one of the most challenging and important programs which has ever been encountered by any telephone company. First of all it is a natural for publicity and good public relations. It attracts interest of practically every telephone user.

Then, too, I would remind you that the conversion to Direct Distance Dialing is quite different from any other conversion. For example when you convert from manual to dial service you instruct your customers as to the use of the dial and the new service. Actually, though he has to learn how to use dial service, for on a certain date he must use it or do without service. This is not the case when you provide Direct Distance Dialing. You spend thousands of dollars to provide a new and improved service, but the operators are still at the switchboards, the customer can continue to place his calls as he has in the past and if he does that, your investment is of reduced value.

This is the strongest argument I can present to impress upon you the importance of a well planned educational program, one which will make the subscriber realize the value and convenience of the new service to him and want to use it. At the same time it affords a wonderful opportunity to build better public relations with the customers you serve. The program for your educational plan should be worked out just as carefully as the equipment and traffic questions which are a part of the establishment of Direct Distance Dialing.

This discussion will be confined to subscriber and employe education, advertising, and publicity in connection with the inauguration of Direct Distance Dialing and as mentioned previously is really a case history, or record of what our company did. I would not leave the impression that training the commercial, traffic, accounting and equipment personnel is not necessary. This is far from the truth for they will need specialized training in the new methods which accompany Direct Distance Dialing.

A 3-Part Program

WE, AT Northern Ohio Telephone Co., developed a program which we thought would do the things necessary for a successful introduction of Direct Distance Dialing. It is not the result of any one person's thinking but a cooperative planning by all responsible for the operation of the company. Actually there are three parts to the plan: (1) Preliminary announcement of the coming of Direct Distance Dialing; (2) two months intensified program in advance of conversion; and (3) the post conversion program.

First of all let us consider the preliminary announcement. Perhaps you are building a new building, remodeling or adding to an existing building, and if so your news release concerning the activity at the telephone building will include the reason for the work being done and Direct Distance Dialing will be mentioned without any specific date. It is highly probable that this announcement will be far in advance of the coming of the new service and may not attract too much attention.

This phase of your program does, however, include a very important part of your over-all program — employe education. Actually we might spend all of the time allotted us talking about the importance of well informed employes. I often recall a time when I appeared before the service club in a community which we served with an unattended dial exchange. My introduction went something like this, "We are pleased to have with us this evening a representative of our telephone company. We do have telephone service, we use it every day; occasionally we see telephone trucks, and with regularity we are mailed statements, but it is very rarely we see anyone from the telephone company."

This is one of our great problems, we are losing contact with our subscribers. An ever increasing number mail their payments to our business offices and the repairman or construction workers are about the only representatives of the company the subscribers ever see.

Fortunately most telephone employes are good citizens, and they meet many of our subscribers at church, over the backyard fence, at civic and fraternal affairs. To the peolpe they meet, *they are the telephone company*. The subscribers expect our employes to know all of the answers to their questions and problems. The employes are ambassadors without portfolio, and they may create a great deal of good will, or — the opposite may happen. It is not only important, but it is our responsibility to make certain that our employes are well informed. When they are able to answer questions, to make known plans of the company, it increases their prestige among their friends and acquaintances, it instills pride in their association with our industry, and makes them better employes.

It is our desire that all employes know our plans before specific information is made public. To accomplish this we arranged a series of meetings which were attended by all employes, regardless of the department in which they are employed. They were given detailed information not only of our plans, but also as to the actual operation of the service from the subscriber's viewpoint. They heard every conceivable question, and the correct answer before they left the meeting. It might be added at this point that these questions and answers were prepared by the department heads of our company.

The employes appreciate being informed; it made them feel as if they were a part of the "team." I am

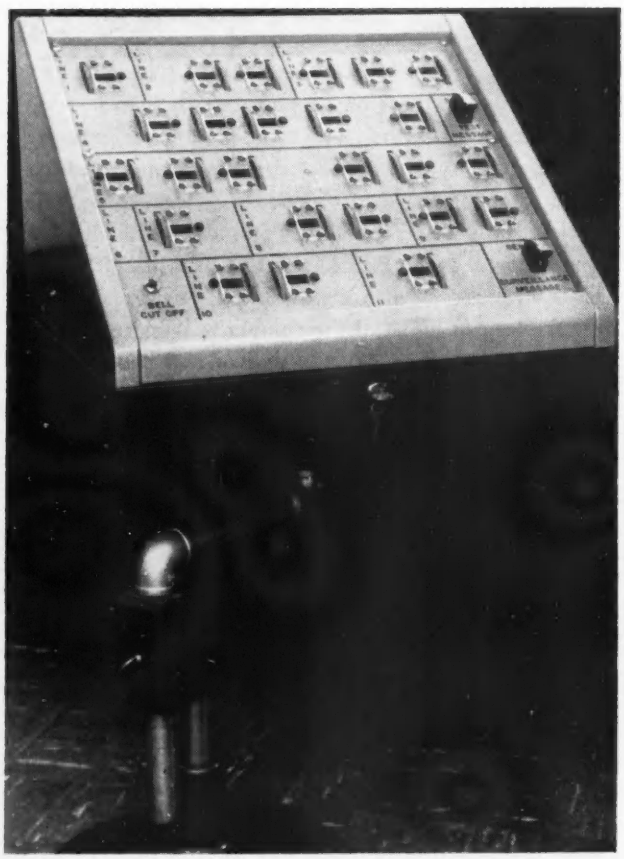
Please turn to page 56

LINE	MESSAGE TRANSMITTED	MEANING
1	0216	TIME (GMT)
2	30	ALTITUDE (THOUSANDS OF FEET)
3	25	SPEED (TIMES 10 MPH)
4	SE	DIRECTION
5	PC	STATION IDENTIFIER

FIGURE ONE: — A portion of a typical surveillance message.

An Automatic Message Composer

By H. A. GROSS*



The automatic message composer unit.

THE MOST critical element in air defense is time — the precious time between alert and reprisal during which interceptors would take to the air, retaliatory bombing would get under way and civilian populations would take cover. Thus, the basic mission of the DEW-Line, North America's first line of defense against surprise attack, is to compile, evaluate and report tactical surveillance information to the NORAD (North American Defense Command) Headquarters at Colorado Springs, Colo., in a minimal time.

Soon after the DEWLine was put into operation, it became apparent that the method of preparing a surveillance teletype message for retransmission to NORAD resulted in inaccuracies and was dangerously slow.

Under the original concept, transmission of a surveillance teletype message from the DEWLine consumed 30 seconds to 15 minutes, depending upon the complexity of the message and the experience of the teletype operator. An automatic message composer which allows accurate retransmission of the message in 45 seconds was designed by a DEWLine technician to alleviate this problem.

As shown in *Figure One*, each line of a surveillance message contains a specific item of information such as speed, direction and altitude of the hostile aircraft. This

**Mr. Gross is an engineer with the Federal Electric Corp., an associate of ITT.*

information is obtained from radar sightings at 29 stations situated across the northern edge of continental North America.

These 29 stations are grouped into six sectors, each sector having one main station and several auxiliary stations. Each of the six main stations receives surveillance data from the auxiliary stations within its sector. One automatic message composer was installed in each of the main stations to retransmit surveillance information received from the auxiliary stations to NORAD in Colorado Springs.

The development of the DEWLine message composer is interesting because it was designed by a technician working in the Arctic without the advantages of laboratory equipment and without the availability of relatively unlimited spare parts. It is also interesting because a message composer of this type can be used for transmitting uniform messages such as weather information, stock quotations, sporting event results, birthday and wedding greetings and traffic data.

In a discussion of the design of an automatic message composer (which essentially is a means of remotely typing a message on a standard teletype keyboard) a short review of the principles of teletype transmission might be helpful.

In the transmission of a teletype character there are seven bits or pulses of information: A start pulse, five character pulses and a stop pulse. Each and every character contains these seven pulses. In fact, each character contains the same start and stop pulse; therefore, the only difference in characters is the five character pulses.

As can be seen from *Figure Two*, the transmitter-distributor portion of the circuit is divided into seven parts. These parts determine the length of transmission of the seven required pulses by interrupting the 130 vdc current flowing in the loop circuit. One revolution of the transmitter-distributor sends one character. To send a specific character it is necessary to set the five switches in the proper position as stated in the teletype code.

For example, if it were desired to send the letter "A," switches one and two would be closed, thereby sending the first two of the five character pulses. To send the letter "Q," switches one, two, three and five would be closed, thereby sending pulses at these positions in the character transmission.

In a normal teletype setup these five switches are closed either by pressing the keys on the teletype keyboard or by using perforated tape. In the message composer the switches are held in the open position and the five switch circuits are closed by means of semi-conductor diodes.

A message composer, for use on the DEWLine, must transmit an 11-line surveillance message in less than 20 seconds, transmit the test message "The quick brown fox jumped over the lazy dogs back" and must include the correct time, in four digits, in both messages automatically.

As shown in *Figure Three*, the DEWLine message composer designed to satisfy these requirements consists of five major sections.

The first section contains the character diodes, which are 31 groupings of five diodes, each grouping corresponding to one of the 31 keys on the teletype keyboard. Although relays were used in the original design,

Please turn to page 62

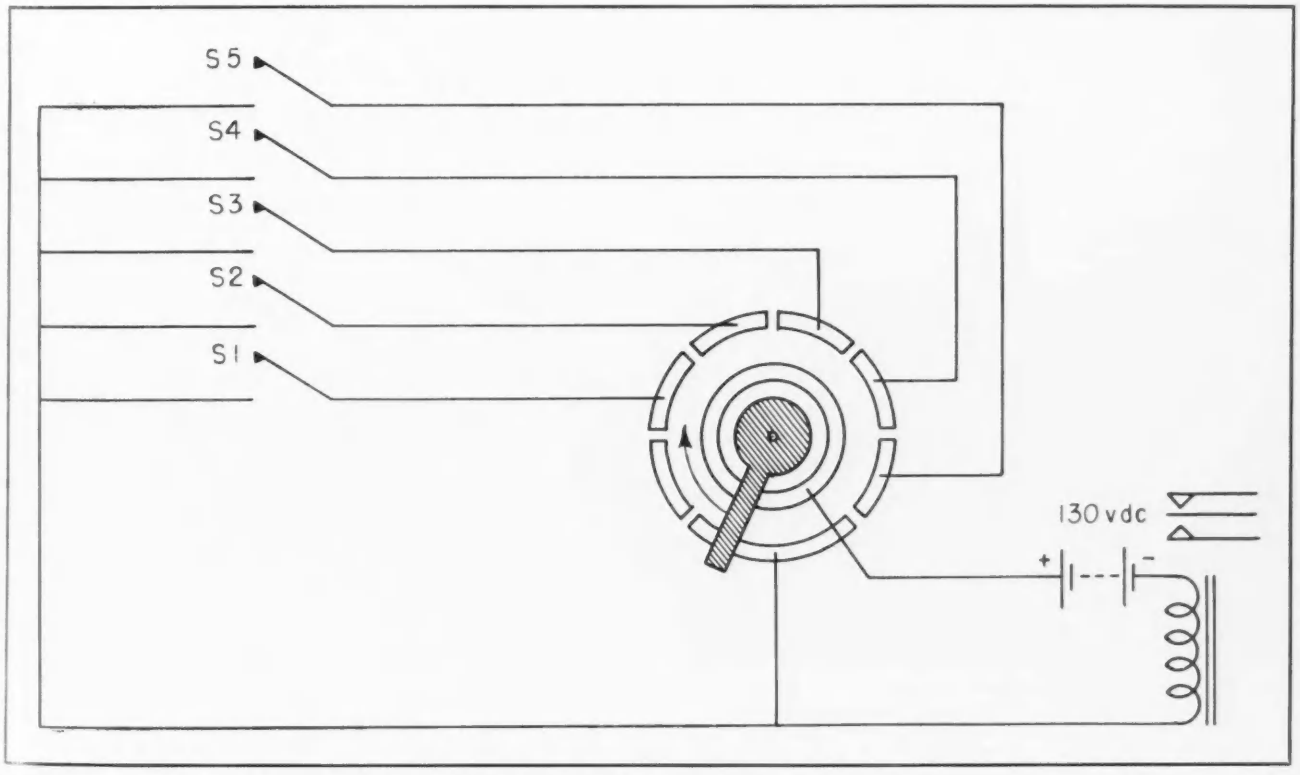


FIGURE TWO: Basic teletype distributor circuit.

Electronic Communications

Copyright 1960, Telephone Engineer Publishing Corp., Chicago, Ill.

A Flame Retardant, Paper Base Laminate For Printed Circuits

NEW PAPER-base phenolic laminate which is said to provide flame retardance with excellent cold punching characteristics at nearly half the cost of epoxy-paper laminates has been developed. Designated Phenolite® Grade XXXPC-476, the base stock meets the electrical, physical and mechanical requirements of NEMA Standards and Underwriters Laboratories tests for flame resistance. It is also available in two copper-clad forms. The first laminate, XXXPC-476-1, is a foil copper-clad unit with standard adhesive bonding which is made primarily for commercial radio and TV applications. The XXXPC-476-2 laminate is copper-clad and is mainly used for electronic computer printed circuits and military applications requiring plating from alkali solutions.

The newly developed laminate is illustrated in *Figures One* and *Two*. It is claimed to be the first paper-base phenolic laminate to offer flame retardance with the cold punching characteristics of XXXP electrical punching grades. Previously, it was necessary to use more expensive epoxy-paper laminates in order to obtain both these properties.

FIG. ONE: — Printed circuit for computer is made of flame retardant XXXPC-476, a low cost paper-base phenolic laminate with excellent cold punch properties. Contact areas of circuit are gold plated. (National Vulcanized Fibre Company)

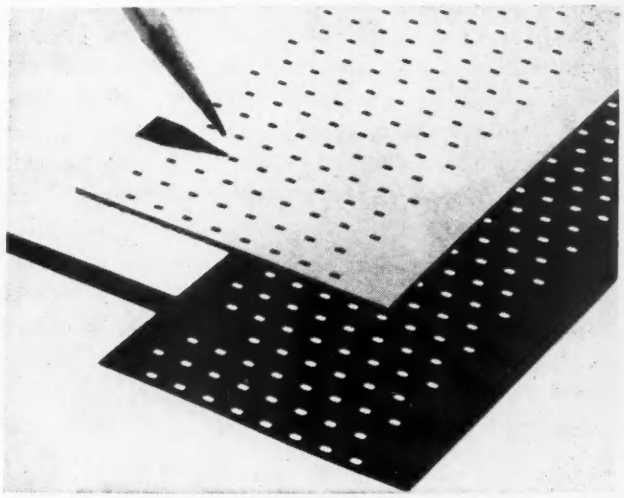
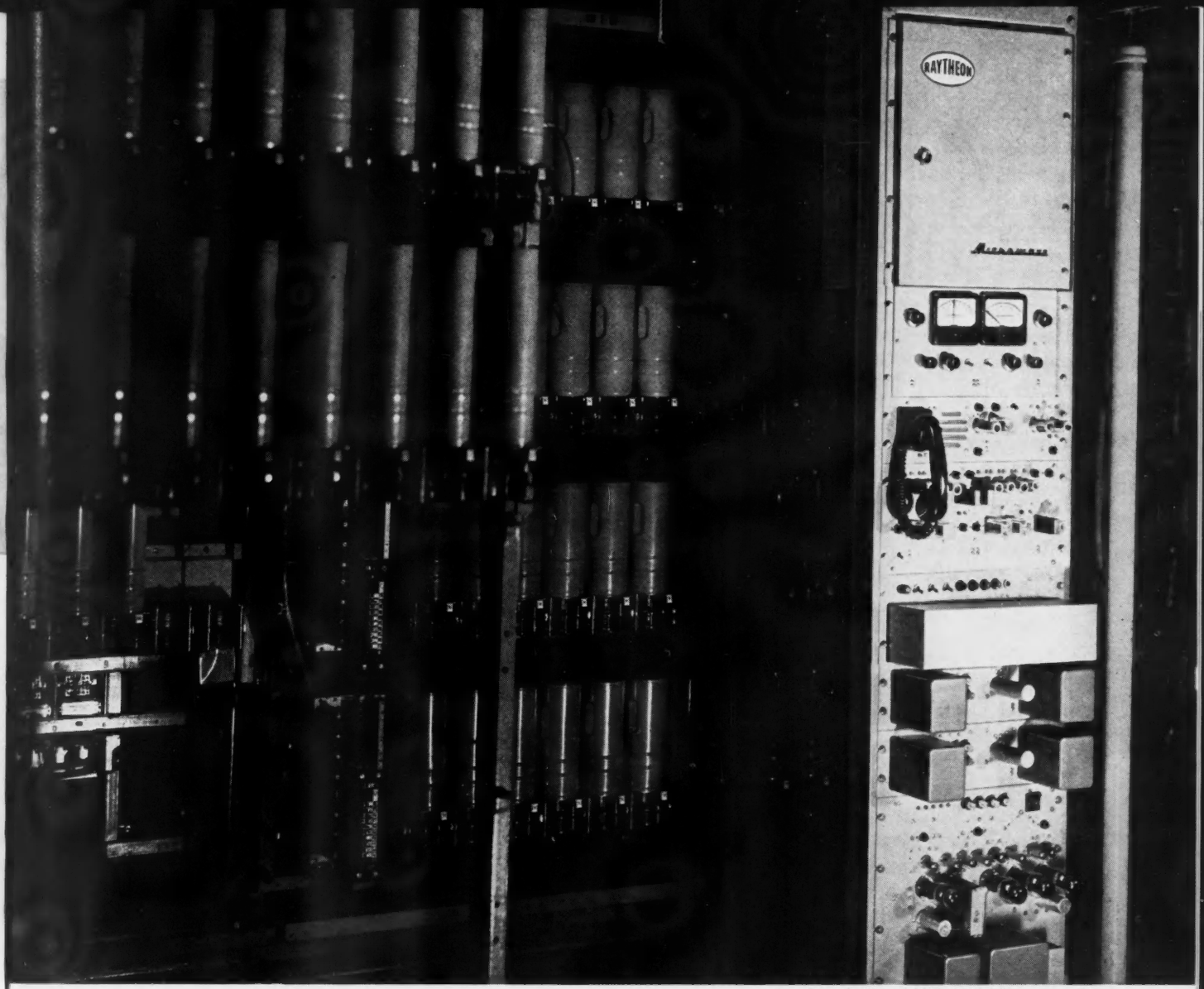


FIG. TWO: — The new flame retardant laminate has excellent cold punch properties. Strip shown is 1/16-inch thick, 2 11/14-inch wide with hundreds of tiny, rectangular perforations made by cold punching.

This new material fills a specific need for a low cost flame retardant material of high quality. This is important not only to computer and electronic equipment manufacturers who have experienced costly fires, but also to manufacturers of radio and television sets. In this latter industry, recognition of fire hazards is responsible for a growing interest in flame retardant materials. The paper-base phenolic laminate is natural in color with a dull finish. It is available in sheet sizes of 39-in. x 39-in. and 39-in. x 47-in. Available thicknesses range from 1/32-in. to 1/4-in.

New, Flexible, Inorganic Films Developed For Wire Insulation

RECENT discoveries at Bell Telephone Laboratories indicate that fluoride coatings can be formed on copper, aluminum and other metal wires which will



Raytheon's New MCR-1000 Microwave Equipment

Raytheon means Reliability in Microwave Systems, Proof: Over 700 Microwave Installations

For a continuous source of reliable equipment for your microwave communications needs, look to Raytheon . . . a supplier to the telephone industry for over 24 years and the world's largest manufacturer of microwave tubes and equipment.

Raytheon microwave equipment has *proved* its reliability in more than 700 installations throughout the world.

Now Raytheon offers MCR-1000, a new one-watt output, 240-voice channel microwave system. MCR-1000 features a stable, long-life Klystron; in-socket tube testing; optional battery operation; an advanced design Combiner for frequency diversity; built-in metering and remote fault-alarms.

With over 41,000 employees in 34 plants coast to coast, Raytheon provides turnkey microwave service — initial survey to final installation. And Raytheon Communication Engineers will fly to your site to help lay out your basic microwave requirements, without obligation.

RAYTHEON EQUIPMENT DIVISION

EXCELLENCE IN ELECTRONICS

Mail Coupon Today For Brochure

DIRECTOR OF MARKETING,
Equipment Division,
Department G-2, Raytheon Company,
West Newton, Massachusetts

Please mail me MCR-1000 Brochure.

*Name and Title*_____

*Company*_____

*Address*_____

*City and State*_____

provide exceptionally high insulation value at elevated temperatures, while retaining flexibility and freedom from porosity.

The insulating coatings are formed directly on freshly cleaned copper or aluminum by exposing them to oxidizing carriers of fluorine such as hydrogen fluoride or elemental fluorine at temperatures from 572° F to 1112° F as shown in *Figure Three*. The thickness of the resulting copper fluoride and aluminum fluoride films depends on the temperature at which they are formed, the concentration of fluorine and the time of exposure. Aluminum forms a fluoride film one micron thick in a few minutes at 1022° F. These films remain adherent when bent repeatedly at 90° angles.

Electrical insulation values are very high for both copper and aluminum films, being 10^{10} and 10^{11} ohms at room temperature for films 1 to 2 microns thick, tested between probe electrodes 1/4 inch in diameter. The films retain their excellent insulating properties at high temperatures. For example, aluminum fluoride films exhibit resistances of about 7 x 10^{8} ohms at temperatures as high as 932° F.

The aluminum fluoride films show excellent resistance to oxidation even above 1112° F. They also show no tendency to hydrate or dissolve on exposure to high humidity. The insulation does not break down even at 450 volts at 932° F.

The best organic insulating coatings cannot be used continuously above 572° F. Inorganic insulators are generally porous and non-flexible, although some may be used as high as 1526° F. Insulating fluoride coatings should be satisfactory almost up to the melting point of the conductor.

This new approach to insulating may provide the answer to some of the problems in missile re-entry guidance systems, as well as other more earth-bound high temperature electrical applications. The technique is said to be applicable to metals other than aluminum and copper.

FIG. THREE: — Drs. STEWARD S. FASCHEN (left) and PAUL D. GARN of Bell Telephone Laboratories inspect a strip of aluminum, coated with their new electrical insulation, after subjecting it to high temperatures in the small muffle furnace. The new insulation is formed right on the surface of aluminum or copper by exposing it to oxidizing carriers of fluorine such as fluorine or hydrogen fluoride gas at temperatures of from 572°F to 1112°F.

FIG. FOUR: — A new data network which lets computers talk on the telephone as they handle inventory control for the Army Signal Corps uses a magnetic tape transmission system developed by Collins Radio Company to link Signal Supply Agency headquarters in Philadelphia, Pa. with the Lexington, Kentucky Army Signal Depot.

Data Transmission System Uses Tape Transmission & Printed Cards

THE nation's first data communications networks for transmitting business, scientific, military and industrial information over telephone lines at the highest speeds ever achieved with commercial-type equipment were recently placed in operation. One of the networks uses a Collins magnetic tape transmission system for inventory control between two Army Signal Corps supply points 650 miles apart. Another, a coast-to-coast link, sends missile design problems and answers on a Collins punched card transmission system back and forth between Charlotte, N. C. and Santa Monica, Calif. for Douglas Aircraft.

Transmission speed for both systems is 300 characters per second, equivalent to 3000 words per minute, and is reported to be double the data rate of any other commercially available equipment. With this speed and capacity, scattered data processing centers can be linked into an integrated system, or a single central computing facility can be extended to distant plants, offices or warehouses.

The Army Signal Corps' tape transmission system links the Signal Supply Agency's headquarters and na-

tional inventory-control point in Philadelphia, Pa. with the Lexington, Ky. Army Signal Depot, 650 miles away. (*See Figure Four.*) The depot in Lexington is one of the principal depots in the U. S. which stocks and distributes electronic, electrical, meteorological and photographic equipment and spare parts for the Army.

Each day a reel of tape from a computer at Lexington which has recorded the previous day's supply transactions is transmitted via telephone lines to Philadelphia at high speed. A 2400-foot reel representing some 25,000 transactions can be transmitted in approximately two hours, about three times faster than the previous method. The supply data is then fed to a larger computer, which up-dates inventory records and produces reports for use by purchasing officers. Before installation of the Collins tape system, punched cards requiring 8-10 hours for transmittal of information and involving several manual operations were employed.

The Douglas data networks using the Collins Kinecard system allow engineers at the company's Charlotte plant to send missile design problems on punched cards 2200 miles over a telephone line to the Douglas computing center in Santa Monica, California, and get answers back the next morning. (*See Figure Five.*) The design data is processed on IBM 704 and 709 computers and includes missile trajectory calculations, thermal analysis, stress analysis, guidance and control studies and test data reduction.

In using the system, the engineer first outlines a problem. This information is then keypunched onto cards which are transmitted to Santa Monica. Computing is done at night, and the answers, which may require up to 10 times as many cards as the input data, are immediately transmitted back to Charlotte.

Present card volume is about 20,000 per day. Full capacity of the Collins system is nearly 100,000 cards per eight-hour shift or 200 cards per minute in full-duplex operation.

The new data communications link between Charlotte and Santa Monica has resulted in savings for the Douglas firm in several ways. Thus, the Charlotte engineers are provided with urgently needed answers in 4 to 7 days less time than before. The cost of installing and staffing computer facilities at Charlotte would have been at least three times the cost of the over-all data transmission system.

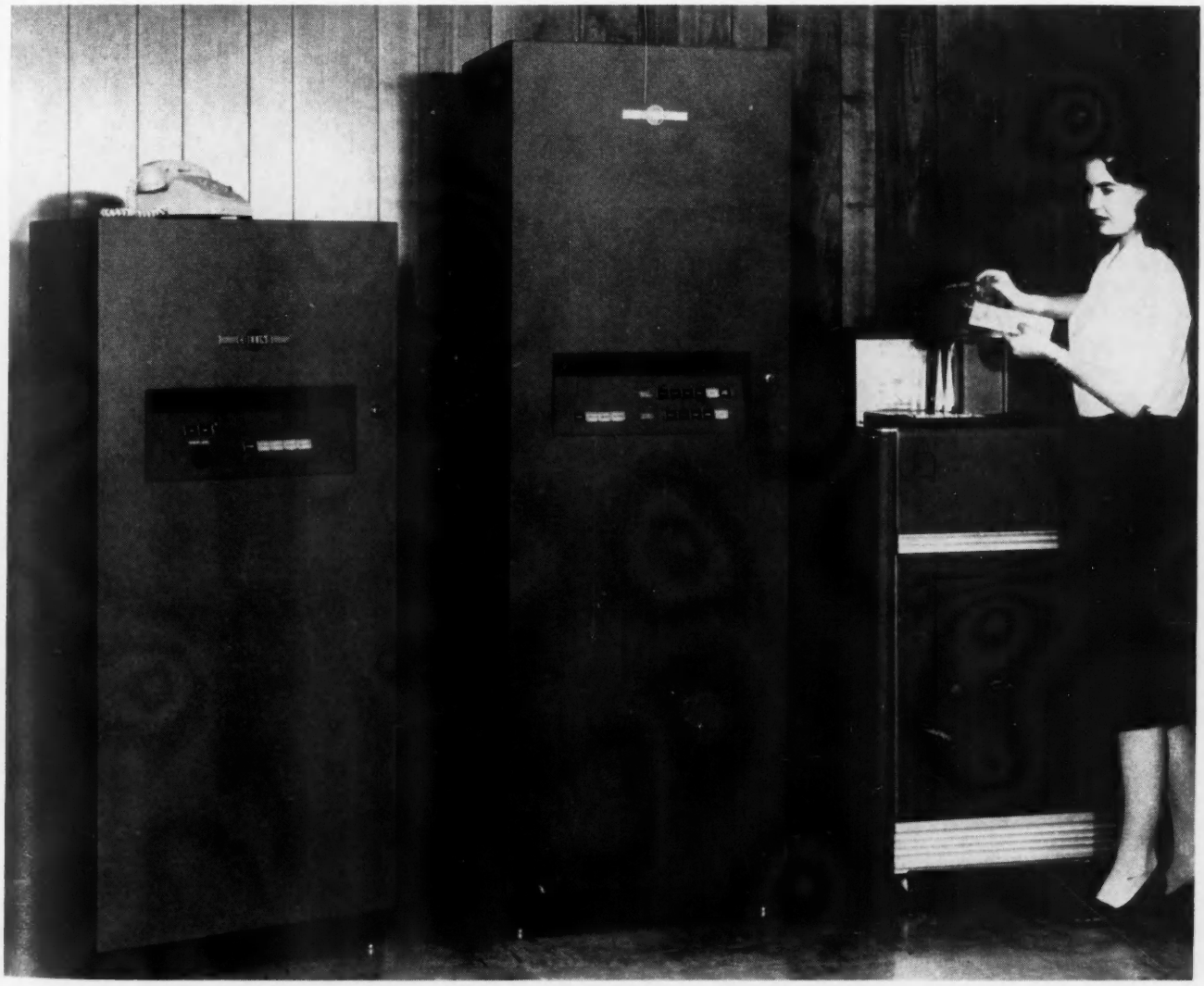
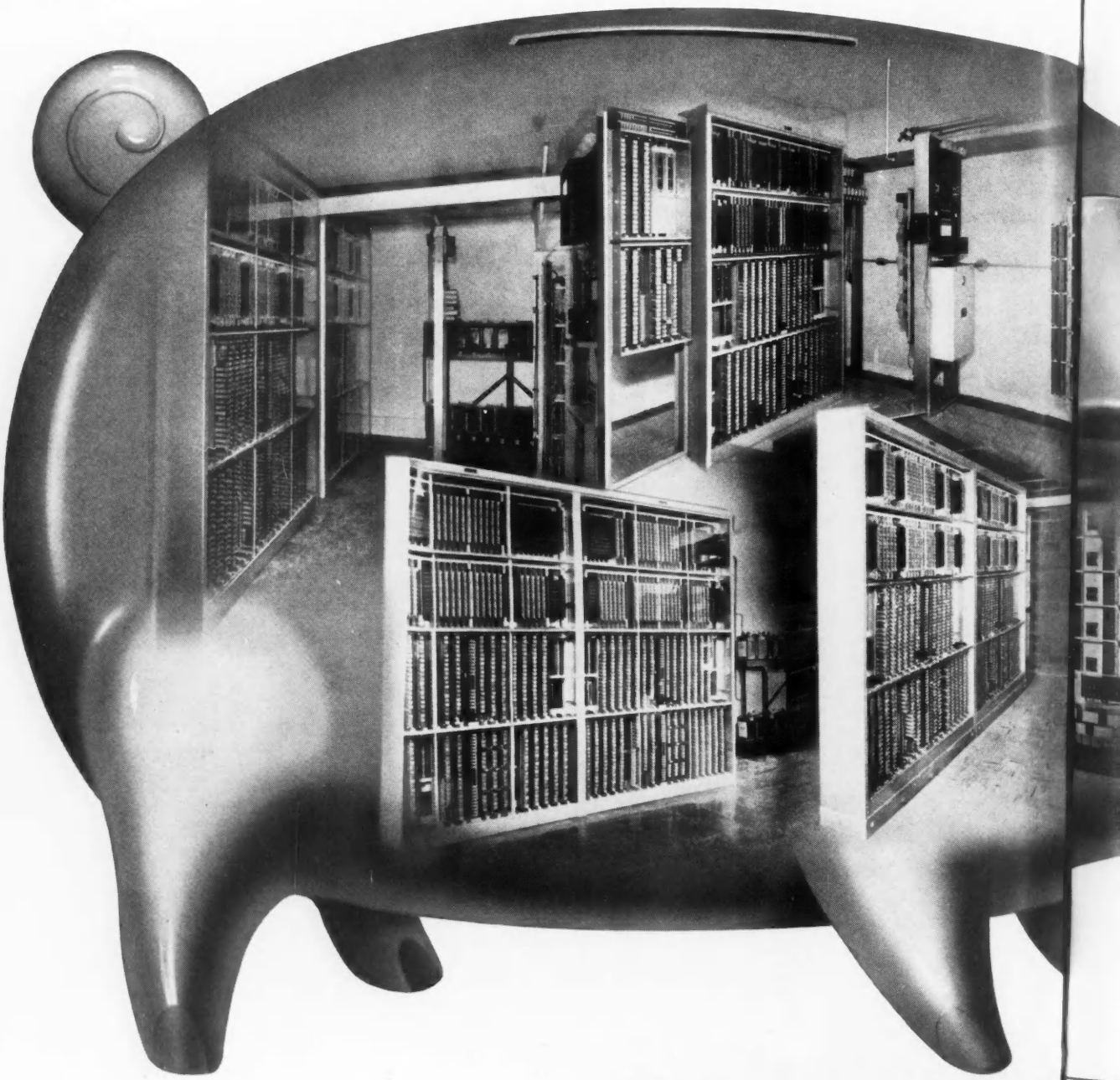


FIG. FIVE: — Shown is the equipment for a new data communications system which helps Douglas Aircraft engineers design missiles over a telephone line. This equipment transmits design problems on punched cards at a 100 per minute rate from Charlotte, N. C. to Douglas computer center at Santa Monica, California.

1271 Money-Savers:

for telephone men across the country. Ov
Why? Jack-in flexibility. All-relay depe
design.

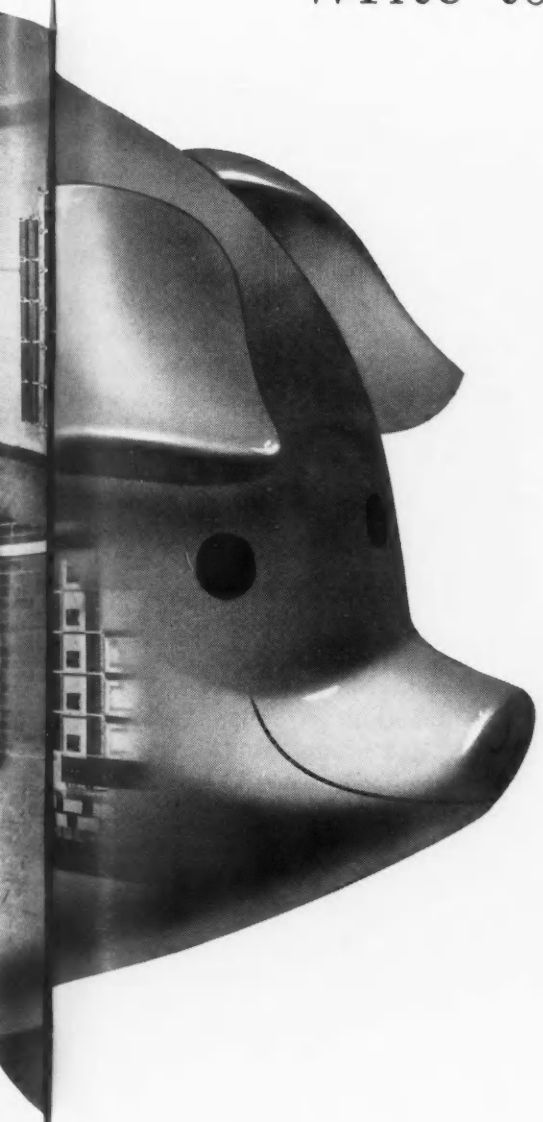


LEICH

Subsidiary of
GENERAL TELEPHONE & ELECTRONIC

eic al Systems cut costs
Ov 200 now in service!
pe bility. Space-saving

Write today.



TYPICAL LEICH DIAL SYSTEM INSTALLATIONS

KAYENTA, ARIZONA
WINDOW ROCK, ARIZONA
ELKINS, ARKANSAS
SWIFTON, ARKANSAS
FORRESTON, ILLINOIS
MANITO, ILLINOIS
YATES CITY, ILLINOIS
ARTHUR, IOWA
ATKINS, IOWA
DEEP RIVER, IOWA
PRINCETON, IOWA
CODY, KENTUCKY
GRAYSON, KENTUCKY
LIBERTY, KENTUCKY
TOLLESBORO, KENTUCKY
MAYFIELD, KANSAS
FROST MINNESOTA
SILVER LAKE, MINNESOTA
WYKOFF, MINNESOTA
VINING, MINNESOTA
BUNCETON, MISSOURI
HARTVILLE, MISSOURI
ANSLEY, NEBRASKA
ARCADIA, NEBRASKA
SARGENT, NEBRASKA
GRASSY BUTTE, NORTH DAKOTA
GALENA, OHIO
MT. CORY, OHIO
NORTH CREEK, OHIO
RICHFIELD CENTER, OHIO
ADAMS, OKLAHOMA
BUTLER, OKLAHOMA
TERRAL, OKLAHOMA
DUPREE, SOUTH DAKOTA
ISABEL, SOUTH DAKOTA
DUTCH JOHN, UTAH
OAKESDALE, WASHINGTON
GLEN FLORA, WISCONSIN
MARSHALL, WISCONSIN
MOUNTAIN VIEW, WYOMING

ICH SALES CORPORATION • 427 WEST RANDOLPH STREET • CHICAGO 6, ILLINOIS
FIC COAST: 11401 W. PICO BLVD., LOS ANGELES 64, CAL.
THWEST: 1227 SLOCUM STREET, DALLAS 7, TEXAS
EAST: 3651 CONNECTICUT AVENUE, YOUNGSTOWN, OHIO
SOUTHEAST: 5126 SOUTH LOIS ST., TAMPA 11, FLORIDA
anufacturers of telephones, switchboards and related apparatus since 1907

COMMERCIAL DEPARTMENT NOTES

By ALLAN R. STACEY
Vice Pres., Sunland-Tujunga Tel. Co., Sunland, Calif.

"Profits From Bold-Face Listings"

The removal of bold-face listings from the white pages of the directory may have improved the directory's appearance, but it has eliminated the revenue potential that lies in additional bold-face listings.

WE USED to say, "Let's clean up our directories. Let's stop taking advertising on the outside covers. Let's remove all bold type listings from the white pages." Working towards these objectives, most of us finally achieved a clean and sterile telephone directory. This was fine until one day younger management growing up in the telephone industry questioned, "How come we are losing all the revenue potential that lies in additional and bold type listings in our telephone directory?" So — in more recent years we have been re-evaluating our earlier decisions. Some general conclusions come forth.

Some General Conclusions

THERE is a good profit potential in alphabetical bold type listings. The reduction of yellow page sales revenue by increasing ABT sales is not usually significant. Rates should be higher for ABT's than for classified bold type listings in order to prevent crowding the alphabetical pages with listings placed here rather than in the yellow pages. And, here's an interesting new conclusion — considerable increase in price for the alphabetical bold type listing in the white pages over the classified bold type listing in the yellow pages has proved to have very little effect, if any, on sales of ABT's.

Comparative CBT-ABT Monthly Rates

LET'S look at several sizes of directories across the country and compare monthly rates for classified bold type listings with those for alphabetical bold type listings. We find that alphabetical bold type rates are often higher without appreciably affecting sales.

For example, in larger directories such as rate groups 19 or 20 (this might be a directory for an area somewhat the size of Cleveland, Ohio) we find average classified bold type listings at rates near $2.80 a month, while alphabetical bold type listings on the white pages go for about $3.30 a month. This is a fifty-cent higher rate to place a bold type listing in the white pages than in the yellow pages.

Getting down into smaller directories, such as rate groups 7, 8 or 9, we find classified bold type listings running $1.20 to $1.35 while alphabetical bold type listings run $1.30 to $1.50. Thus, even in the smaller directories, there is a higher price to get into the white pages than into the yellow.

It is my own feeling that the differential between the yellow and white pages should be even stronger and I think we are progressively widening this differential as time goes on. It seems to me that white page rates can be between 50 and 90 per cent higher than the yellow page rates while still providing a very useful service to the customer and yet not pricing the product beyond the customer's willingness to pay.

Just for fun let's work out a simple rate comparison. In very large books where the classified bold type monthly rate is between $2. and $2.50, we should be able to readily establish an alphabetical bold type monthly rate of $4. to $4.50. This will produce close to a 90 per cent differential between CBT and ABT.

In medium size books where a classified bold type listing might be a $1.50, we could probably make the alphabetical bold type listing 80 per cent higher to get up into the range of $2.70 a month.

In the smaller books where a classifield bold type listing is $.75 or $1.00 a month, we can probably increase 65 per cent to 75 per cent to get bold type rates of $1.25 to $1.75.

Assuming that we can market the product, what is the possible potential for development of alphabetical bold type listings?

Potential Development Of ABT's

THE LAST time I looked at the development possibilities, which was several years ago, I found that in very large books the alphabetical bold type listings were averaging somewhere near 12 per thousand listings; the medium size books were averaging about 20 ABT's per thousand list-

ings and the small books were averaging about 35 ABT's per thousand listings. In short, if your directory shows less than these you have room for improvement to come up to average, and, of course, there is still plenty of room for growth beyond that. I know of one small directory that goes as high as fifty alphabetical listings per thousand.

By now you may be saying, "Okay, I am ready to go after more ABT's but won't it cost me a lot to handle the additional business?"

Development Expense

ONCE we sit down and discuss this program with our directory sales people, we shall probably be pleasantly surprised to find that the additional expense is nominal. Naturally, there will be some sales promotion expense, possibly some commissions or wages to sales persons, and some additional clerical and compilation costs, but these increases are not excessive.

I think we can generally conclude that costs relating to paper and printing, extra composition, stationery forms and personnel training are so nominal that they can be absorbed into our present operations.

You are invited . . . to tell TE&M authors your problems of department policy or procedure on which you'd like to have an opinion.

While we don't claim to have all the answers, we'll welcome the opportunity to discuss as many as possible in our columns.

Eliminating these items we shall probably find that the costs of promotion, extra commissions or sales persons and clerical will come somewhere near $1 to $1.50 per new ABT sold. On this basis we are well ahead. If our monthly rate is $1 we find that we've covered the cost of obtaining the listing with not more than the first two months' revenue from publishing that listing. I suggest you compute it for your own company and see whether alphabetical bold type listings would be worth while for your further attention and promotion. — *Allan R. Stacey.*

"Off The Board"

Communications Securities

Markets as of October 26, 1960	DIVIDEND	BID	ASKED	LAST SALE
American Tel. & Tel. Co.	3.30			90¾
Anglo-Canadian Tel. Co. (Br. Col.-Dom. Rep.)	1.20	36½	39½	
Bell Tel. Co. of Canada	2.20			47¼
British Columbia Tel. Co.	2.20	46¼	49¼	
Calif. Interstate Tel. (Calif., Nev.)	.70	13⅛	13½	
Calif. Pac. Util. (Calif., Nev., Ore.)	.90	20	22	
California Water & Tel. Co.	1.36	29½	31	
Carolina Tel. & Tel. Co.	1.60	40½	43	
Central Elec. & Gas Co.	1.20	26	28	
Central Tel. Co. (Minn., Ia., N. C.)	.88	21¼	23¼	
Chenango & Unadilla Tel. (N. Y.)	1.20	26	—	
Cincinnati & Suburban Tel. Co.	4.50	92	96	
Citizens Util. Co. (Calif., Pa.) "A"	Stk. Only	18½	20	
Citizens Util. Co. (Calif., Pa.) "B"	.48	16¾	18	
Commonwealth Tel. Co. (Pa.)	1.00	20	21½	
Florida Tel. Corp.	1.00	26½	28½	
General Tel. & Electronics Corp.	.76			24⅞
Hawaiian Tel. Co.	1.00	22	23½	
Independent Tel. Co.	none	8	9	
Indiana Tel. Corp.	.50	24	28	
Inter-County Tel. & Tel. Co. (Fla.)	.72+stk	24½	26½	
Inter-Mountain Tel. Co. (Va., Tenn.)	.80	15¾	17	
Jamestown Tel. Corp. (N. Y.)	5.60	85	—	
LaCrosse Tel. Corp.	.80	15½	—	
Lincoln Tel. & Tel. Co. (Nebr.)	2.60	64	—	
Lorain Tel. Co. (Ohio)	1.40	32½	—	
Middle States Tel. Co. (Ill.)	.80	26	29	
Mountain States Tel. & Tel. Co. (Ariz., Colo., Mont., Tex.)	.90			27¼
New England Tel. & Tel. Co.	1.72			36⅝
North Carolina Tel. Co.	none	1	1⅛	
Northern Ohio Tel. Co.	2.00	52	55	
Pacific Tel. & Tel. Co.	1.14	27	29	
Peoples Tel. Corp. (Pa.)	4.00	100	—	
Pioneer Tel. Co. (Minn.)	1.00+stk	34	38	
Rochester Tel. Corp. (N. Y.)	1.00			22
Southeastern Tel. Co. (Fla.)	1.00	21	23½	
Southern New England Tel. Co.	2.20	44½	47	
Southern Nevada Tel. Co.	1.00	26½	28½	
Southwestern States Tel. Co. (La., Ark., Okla., Tex.)	1.20	24	25½	
Telephone Service Co. of Ohio "A"	.36	29½	32½	
Telephone Service Co. of Ohio "B"	.36	29	32	
Tidewater Tel. Co. (Va.)	1.40	25	—	
Virginia Tel. & Tel. Co.	1.00	20½	—	
United Utilities, Inc.	1.40	40½	43	
West Coast Tel. (Wash., Ore., Calif.)	1.28	26⅝	28⅜	
Western Union Telegraph Co.	1.40			42⅝
Western Utilities Corp.	.36	8⅛	8⅞	
Western Light & Tel. Co., Inc. (Mo., Kans., Ia.)	2.00	42¼	44¾	

(Source of Market — DEAN WITTER & CO.)

NEW MINIATURE RINGER

Helps You Sell Compact Phones

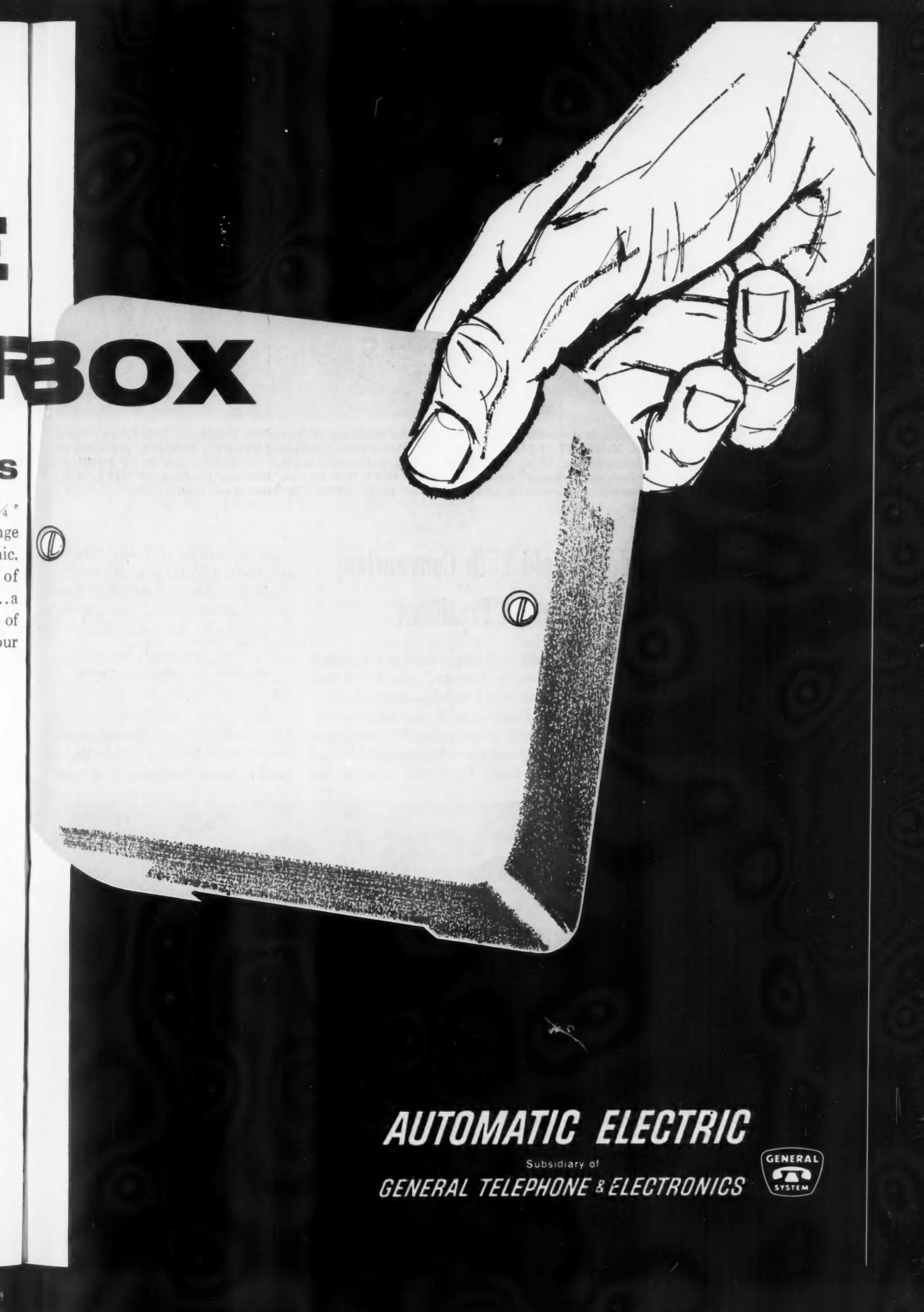
Here's a new ringer box designed by AE engineers to help you sell more compact phones. Now you can sell the Starlite* or Space-Maker* phone as a main line or as a ringing extension. Because it's smaller, this box is easy to keep out of sight. It's less conspicuous even when wall-mounted. And, it comes in 10 colors to blend into any decor.

The miniature ringer box measures just 5¼" by 5¼" by 2 1/16" deep. Available in a full range of frequencies, both harmonic and decimonic. As a result, you offer the convenience of miniature design *plus* big-ringer quality...a combination that's sure to increase the use of compact phones in your community. See your AE representative for complete details.

*STARLITE and SPACE-MAKER are trademarks of Automatic Electric Co.

SOLD. **ONE STARLITE.** As a main line, the Starlite requires a ringer. The trim design of our miniature ringer box complements the beauty of Starlite...even to the matching color.

SOLD. **ONE SPACE-MAKER** extension phone. For the customer who insists on a ringing extension, our miniature ringer box is the answer. It complements the practical design of Space-Maker.


BOX
AUTOMATIC ELECTRIC
Subsidiary of
GENERAL TELEPHONE & ELECTRONICS
GENERAL
SYSTEM

Speakers group at general session of Anniversary convention of the Michigan Independent Telephone Association: Front Row (L. to R.) — FOSTER McHENRY, Jefferson City, Mo., USITA 1960 president; WELDON W. CASE, president of Mid-Continent Telephone Corp., Elyria, Ohio; C. D. McLELLAN, executive secretary of MITA; and HON. JOHN B. SWAINSON, lieutenant governor of Michigan. Back Row: JOHN COLLVER, Climax, first vice president of MITA; R. J. SCHAFER, Pinconning, convention chairman; and JUDD PERKINS, Muskegon, toastmaster.

Michigan Independents Hold 25th Convention; K. B. Sage Elected Association President

MEMBERS of the Michigan Independent Telephone Association, celebrating the organization's Silver Anniversary with a new convention-attendance record, were challenged to meet the next decade with even greater vigor and ingenuity than the last quarter-century demanded.

Highlighting convention activities at Mackinac Island was an address by the Honorable General Arthur E. Summerfield, Postmaster General of the United States, who discussed "Communications in the 60's." The impact of the timely, and somewhat controversial, "facsimile plan" on the telephone industry was a subject that brought the Postmaster General an attentive, interested audience. The fact that a Michigan city will, with Washington and Chicago, be a key point in the first facsimile transmission made General Summerfield's address one of particular interest.

In comparing the "progress of the two greatest communications systems on earth — the United States Postal System and the American telephone industry," the speaker described "Project Turnkey," the Postal Department's first fully-automated office at Providence, R. I., and reported that the instantaneous facsimile transmission between Washington, Chicago and Battle Creek will transmit 180 pages per minute at a cost little, if any, higher than the present costs. He emphasized that the established communication companies will provide the facilities for this transmission.

In a year when people are politically conscious, an outstanding event of the General Session was an address by Michigan's Lieutenant Governor John B. Swainson. Speaking on an issue that was the most vital to Michiganders in the November 8 election,

HON. JOHN B. SWAINSON, Michigan lieutenant governor, (center) is greeted at hotel by D. MUSSER, president of the Grand Hotel, and C. D. McLELLAN, executive secretary of the Michigan Independent Telephone Association.

Recording "Get Well" wishes for Larry Reynolds and Pat Taylor, MITA president and vice president who were kept from the convention by illness are (L. to R.) — CHIP McLELLAN; DAVE HUNTER, REA representative and MRS. HUNTER; DON CARLSON, association convention chairman, Morenci; MRS. VERNON HUFFORD, wife of commission staff head; and L. W. REYNOLDS, JR., son of the absent president, and MRS. REYNOLDS.

the speaker gave a non-political review of the problems faced by voters in determining their decision on the calling of a Constitutional Convention. Speaking on "The Pros and Cons of Con-Con," the Lieutenant Governor traced the history of the state's constitution and gave his listeners a sound understanding of the facts they must weigh in determining what their decision will be in November.

In concluding, the speaker urged the group to become actively engaged in politics, and stressed the fact that as community leaders telephone people should actively decide on a party of their choice and work toward its success in their community.

The same request for active participation by telephone people in political affairs was made by Weldon Case and Postmaster General Summerfield in their addresses. The latter concluding that "good government is no accident," urged his listeners to "select and support good people to serve in public office."

Lieutenant Governor Swainson is his party's nominee to succeed Gov. G. Mennen Williams, Michigan's retiring Governor, who was unable to attend the convention.

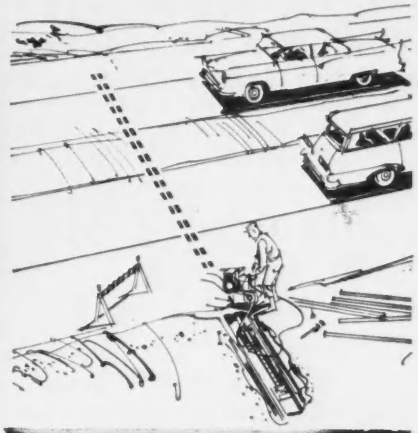
The old adage of the shoemaker's children being without shoes proved not to apply to Michigan's Independent Telephone Association as it met at the Grand Hotel on Mackinac Island. L. W. Reynolds, president of the Association, under his doctor's orders to miss his first Michigan convention in a quarter century, "attended" all the sessions of the convention over private line facilities, provided by Michigan Bell, to his home at Ontonagon, 300 miles from the island.

The challenge of the new decade was the theme of others who addressed the Michigan Independents.

In his first address to the Michigan Industry, the Honorable George E. Hill, newly appointed chairman of the Michigan Public Service Commission, pointed out that in 1935 — when one family out of four had a telephone — the major problem of Michigan companies was simply "how to survive." Today with four out of five families having service the problem is "how to better meet the needs of customers through improved service, expanded service and new services — a service and marketing problem." Charman Hill noted that telephone people are not alone in facing the responsibility, "for part of it lies

Next page, please

EASY, LOW-COST WAY TO RUN PIPE UNDER STREETS AND WALKS



Greenlee Hydraulic Pipe Pusher

Traffic proceeds as usual when your piping for underground cable crosses under the street this simple timesaving way. Model No. 790 shown pushes ¾" - 4" pipe about two feet per minute with power pump. A small ditch in the parkway accommodates the pipe pusher — streets and walks remain undisturbed, total job time is cut to a fraction. Ask your supplier for details or write for free literature.

OTHER GREENLEE TIMESAVING TOOLS FOR TELEPHONE WORK: UTILITY CHISELS, POWER BITS, BRACE BITS, BELL HANGERS' DRILLS, ANGLE SCREW DRIVERS

GREENLEE TOOL CO.
1778 Columbia Avenue
Rockford, Illinois

GREENLEE

Crapo

HTL-195

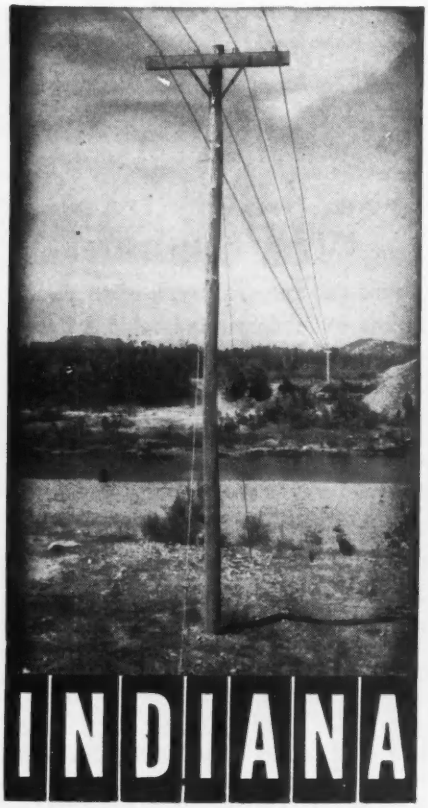
EXTRA HIGH-TENSILE TELEPHONE LINE WIRE

for low-cost Rural Lines

- Spans up to 600 feet in Heavy Loading, 650 feet in Medium Loading and 700 feet in Light Loading districts are possible where Crapo HTL-195 is employed. This extra long span construction results in marked savings in costs per mile of line. Pole structures can be reduced to a minimum. Fewer pole structures mean substantial savings both in materials and man-hours of labor. There is less hauling to be done, fewer holes to dig, less material to be handled, installed and connected.

Improved electrical qualities make practical typical subscriber loops of 14 to 15 miles with normal voltages and equipment. Also can be used for subscriber carrier.

Write for Engineering Manual No.TM-59



INDIANA

STEEL & WIRE CO., INC.
MUNCIE, INDIANA

with your Public Service Commission."

Chairman Hill in answering the question of difference between "reasonable cost" and "reasonable rate" said, "One of the great strengths of our society and our economy throughout our history lies in the never ending drive to better our performance; to better the standard of living; and to better our way of life. This philosophy is just as applicable to the practice of regulation as it is to any other facet of our society. This difference, therefore, allows the Commission to recognize and reward an outstanding — an efficient — management job. Without this provision, the inefficient management would be rewarded and the efficient management would be penalized."

In explaining his desire to have an "understanding Public Service Commission," Chairman Hill said "always remember, we're interested in but one thing — that customers in Michigan have the best possible service at reasonable prices. Let me amplify. When I say best possible service, I have in mind providing service to those who do not now have it and providing better grades of service and more service to present customers on a trouble-free basis. By reasonable prices I mean rates which are fair both to you and to the customer. If the rates are too low it will not be possible to provide more and better service to the people of this state. On the other hand, rates should not be at such a level as to yield lush profits. And, I gather from what *you* tell me that this situation does not exist in the telephone industry in Michigan.

"Bring us your problems and we will do all within our power to help you solve them. However, I would be remiss if I failed to emphasize that for us to be of maximum help to you, we must be provided with accurate and adequate data. I want to emphasize that accurate and adequate data are essential to the job of both the commissioners and the commission staff. We feel that we can depend upon most telephone companies to furnish us with complete and reliable information upon which we can base our conclusions and recommendations.

"Were it necessary for us to send investigators to examine into complaints for data and background material, the cost would have to be borne, directly or indirectly, by your customers. Our present methods have

Independent extremes meet at Michigan convention as MALCOLM GARRISON (R.), president of Faithorn Telephone Co., explains problems of his 33 subscriber exchange to AUSTIN SAUNDERS, president of General of Michigan, who is concerned with more than 250,000 customers. GEORGE E. HILL (center), chairman of the Michigan Public Service Commission listens with interest.

proven very reliable and effective and the continued use of these methods whereby we request a report from you on the complaints we receive, can continue only so long as we receive prompt, accurate and complete reports."

In the absence of President Reynolds, John Collver, vice president presented the association's anniversary report. The report reviewed association activities since 1935 when Michigan's Independent industry consisted of 383 operating companies and 1100 roadway companies. Tracing the association's growth from 17 participating companies, Vice President Collver pointed out that original objectives of the founders were being met through effective leadership being proivded by the several presidents of the association.

He complimented the directors of a number of smaller companies who were present on their attendance and expressed the hope that other companies would have more of their directors taking an active part in association activities.

Referring to the progress made by the Michigan Independents, Collver pointed out that in 1935 there were 83,000 Independent subscribers as compared with the present 325,000, only 4 percent of whom still have magneto service. Since 1952 the number of service complaints made to the commission have been reduced from 40 per thousand stations to only 19 per thousand. The speaker urged the attending group to continue their efforts in improving service, modernization of plant and improving public relations.

Foster B. McHenry, president of the United States Independent Telephone Association, speaking on "The Golden Decade is Here," emphasized that the Independents must use every available resource for developing the highest skills in personnel at all levels, and urged that management take advantage of the USITA sponsored courses given annually at Kansas State and Michigan State Universities.

In a well-deserved tribute to USITA Executive Vice President Clyde Bailey, Mr. McHenry, explained the importance of the Association staff

1 NO. 125 ELECTRICAL FILLER TAPE

Fills voids in splice bundle in a matter of seconds . . . provides foundation for subsequent tape layers . . . a ⅛-inch thick insulating compound in tape form that can be molded by hand to comfirm to irregular shapes and contours.

2 BI-SEAL SELF-BONDING (polyethylene based) **ELECTRICAL TAPE**

Is the strong moisture barrier. Layers fuse so tightly it's impossible to delaminate them. Excellent chemical, mechanical and thermal properties. Bi-Seal has no right or wrong side; will not stick or tangle during application; workable to—40°C.

3 BISHOP VINYL ELECTRICAL TAPE

No. 1 (7-mil) and No. 2 (10-mil) is used for final abrasion-resistant covering. A thin, tough, resilient, pressure-sensitive tape with great adhesive strength. Also popular as an all-purpose tape for general splicing jobs.

SOLD ONLY BY LOCAL AND NATIONAL TELEPHONE SUPPLY DISTRIBUTORS

MORE THAN A CENTURY OF BISHOP ELECTRICAL INSULATION

BISHOP MANUFACTURING CORPORATION
11 CANFIELD ROAD
CEDAR GROVE (ESSEX CO.) N. J.

In emergencies, Graybar, too, is always ready to help

Emergencies come in many sizes, not all so easily handled as this. Wind, flood and ice can wreak havoc on your lines, with little or no warning, as all in the industry know. When an emergency arises in your area, whether day or night, you can always count on Graybar for the vital, extra help you want.

Call us, also, whenever a need arises for technical assistance. Graybar is staffed for the job.

And we are equipped to meet virtually any request for supplies and materials. Graybar offers a wide range of quality lines made by leading manufacturers.

For prompt action, call your nearby Graybar office.

Graybar is your number one source for service... technical assistance...quality equipment...prompt delivery.

913

GraybaR

ELECTRIC COMPANY, INC.

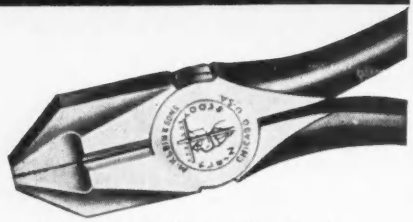
INDEPENDENT

420 LEXINGTON AVENUE, NEW YORK 17, N. Y. • OFFICES IN OVER 130 PRINCIPAL CITIES

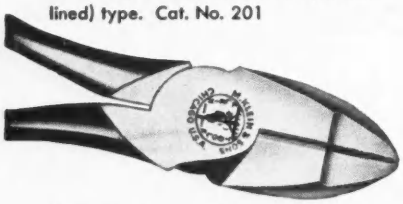
Everything Electrical GraybaR

KLEINS

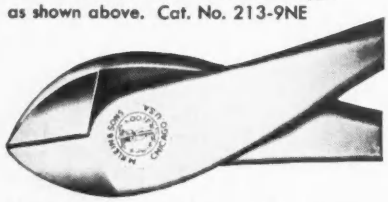
for LINEMEN and ELECTRICIANS



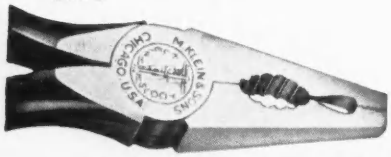
The Original Klein Side Cutting Plier—Also available in NE (Streamlined) type. Cat. No. 201



High Leverage Plier—Extra high leverage permits cutting extremely tough wire. Also available in the standard type as shown above. Cat. No. 213-9NE



High Leverage Oblique Cutting Plier—A recently introduced plier designed to cut toughest wire. Cat. No. 228-8



Electrician Conduit Plier—Reams inside and outside of conduit, tightens lock nuts in outlet boxes. Cat. No. 333-8

"Since 1857" the name Klein has stood for the finest in tools and equipment for linemen and electricians. It is the uncompromising high quality back of the name Klein that has won Klein Pliers their place in the hands of men who know good tools. Klein Pliers are now available in a wider variety of styles and sizes than ever before. Be sure the pliers you need carry the Klein trade-mark.

Klein Catalog Free—This new Klein catalog giving complete information on Klein tools and equipment for linemen and electricians will be sent on request. Write for your copy.

Ask Your Supplier—Foreign Distributor: International Standard Electric Corp., N.Y.

Mathias KLEIN & Sons
Established 1857 Chicago, Ill., U.S.A.
7200 McCORMICK ROAD • CHICAGO 45 ILLINOIS

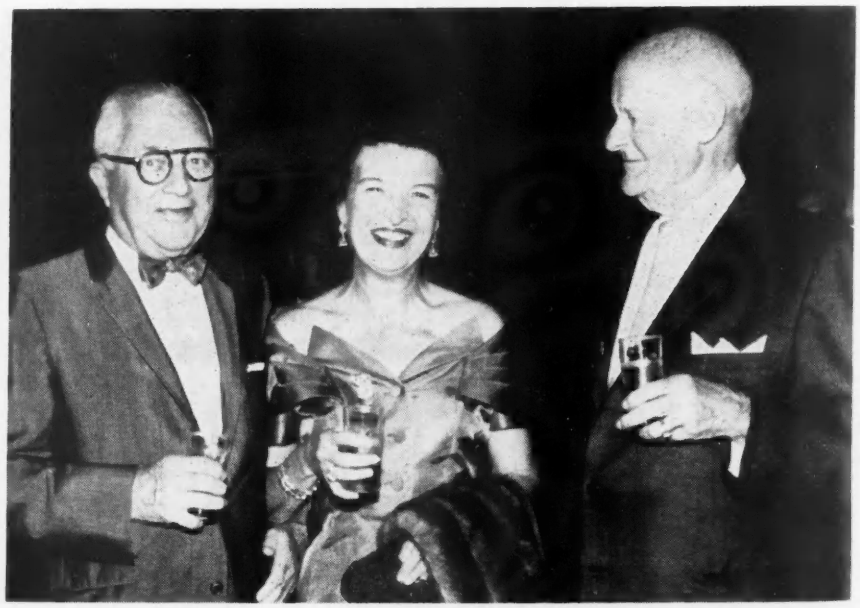
functions and their value to the Independent telephone industry. He pointed out that "with 11 million phones integrated into the national communications systems, we have arrived at a new plateau and regulatory agencies must recognize that since we are on a new economic plateau, rates to subscribers must be on that level to attract more investors who will demand competitive interest rates."

Weldon W. Case, president of Mid-Continent Telephone Corp., Elyria, Ohio, impressed small company representatives with his address on "The Small Company In the 60's." A redefining of the meaning of "small" in relation to telephone companies provoked interest and discussion in the audience. He pointed out that the August 20 issue of *Business Week* stated that "any company with less than 10,000 telephones is uneconomic."

Discussing Extended Area Service (EAS), Mr. Case said, "There are those of you, I am sure — and I have recently been among you — who say that EAS ought to be paid for by those who use it, and therefore, with mechanization through DDD, the only fair method of providing this service is on some sort of a toll basis. But I call your attention to the fact that no service that is provided through our tax dollar operates in that manner. We pay the same amount of money for the maintenance of our school system whether we have any children in school or whether we don't; we pay the same amount for our highways, both maintenance and construction, regardless of how much or how little we use those highways. A quick look at our economic way of life can't help but point out the fact that we are going further and further down the road of charging everyone for service which is generally conceded to be in the best public interest.

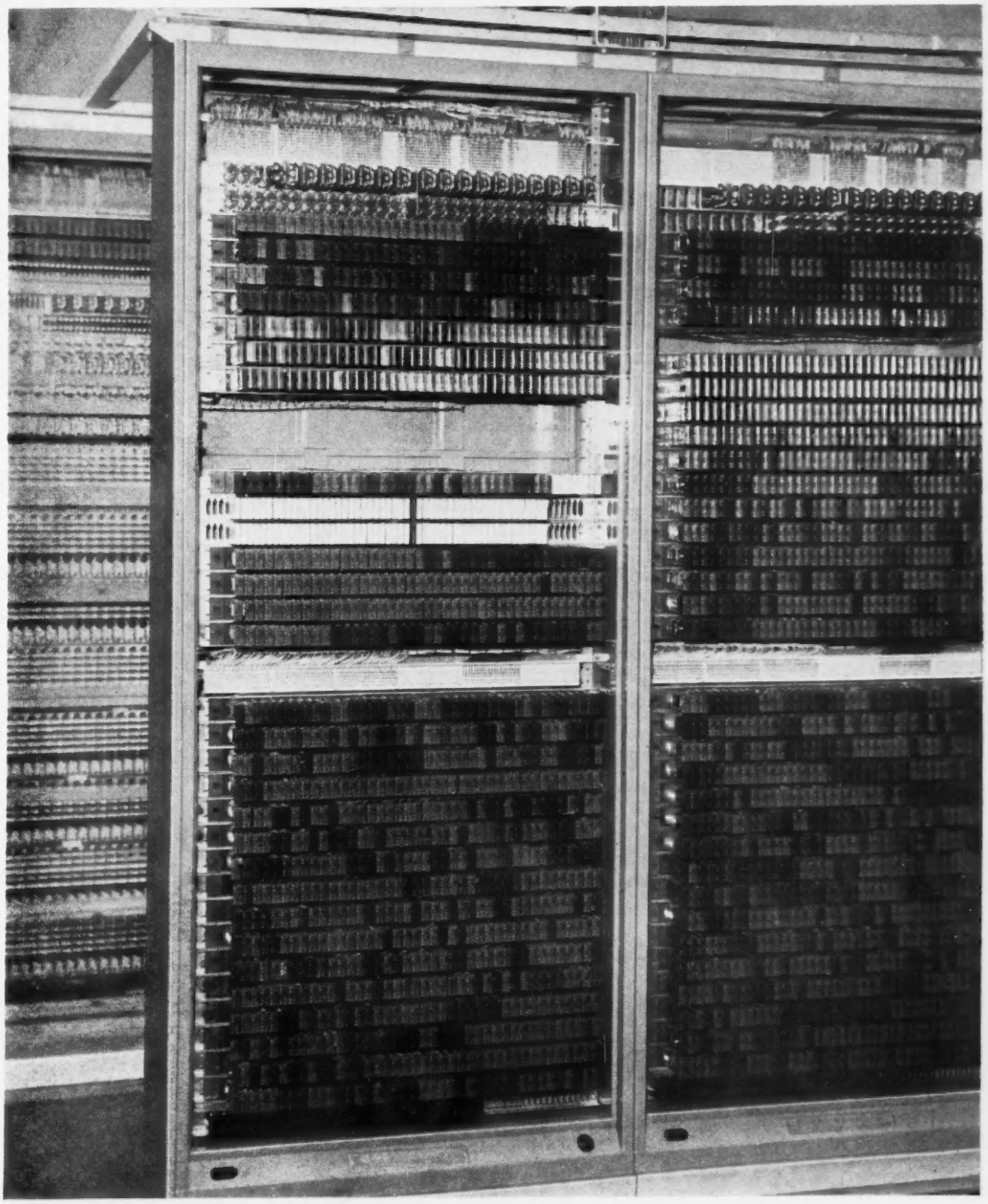
"How can we employ this equipment to greater advantage and still not materially increase our costs of operation? Here is one possibility: During the hours of from 6 or 7 or 8 P.M. until 6 o'clock the following morning, we allow our residential customers, only, to use those facilities with no toll charge — perhaps on an area-wide basis; perhaps on a statewide basis; and, if we carry the dream to the ultimate, even on a nationwide basis. For this service, perhaps we would charge $4. or $5. or $6. a month in addition to the existing rate, but it would give the effect of having area-wide, state-wide, or even nationwide EAS in the non-busy hours. This experiment will be tried in one city in Ohio during the next year."

Although he was able to monitor



Outstate guests chatting at Michigan's convention (L. to R.): — TOM DIAL, Indianapolis; MRS. RUDOLPH, wife of USITA director R. E. RUDOLPH of Ellensburgh, Wash.; and R. H. BURFEIND of Chicago, who was awarded a memento as the industry's "Dean Of Suppliers."

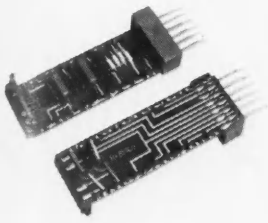
Switch bays (left) and trunk bay of a 200-line semi-electronic PAX installed at Tokyo's Mitsukoshi Department Store.



NEC announces first commercial semi-electronic switching system

Electronic switching has been thought to bring definite advantages only in large-capacity systems. However, recent developments at NEC show that even a small-capacity electronic switching system can offer significant advantages.

- RELIABILITY—highly stable diode logic with transistor amplifiers.
- ECONOMY—use of standardized package unit with inexpensive diodes and transistors.
- EASY TO USE—Push-button telephone sets as well as dial sets can be connected.
- EASY TO MAINTAIN—dust-free, stable electronic circuit.



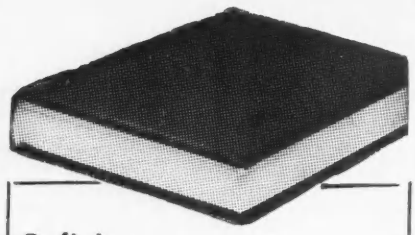
Standard package unit (one of 20 different functional circuits) in the common control can be mounted on standard crossbar panel.

NEC now has the capability for commercial production of semi-electronic switching systems of several hundred line capacity using wire-spring crossbar switches for speech paths and semi-conductors for the control.

More detailed information about the semi-electronic PAX will be sent upon request.

NEC *Nippon Electric Co., Ltd.* Tokyo, Japan

Communications Systems / Electronics



Defining

6500 Terms commonly used in Electronics and related fields

Here is a well-illustrated dictionary containing clear-cut and accurate definitions of nearly 6500 terms used in radio, television, industrial electronics, communications, facsimile, sound recording, etc. This compilation of authoritative, readily understood definitions constitute the most comprehensive dictionary of its type available. There are more than 600 appropriate diagrams and sketches to illustrate the principles and equipment described.

ELECTRONICS DICTIONARY

By NELSON M. COOKE, Lieutenant Commander, U.S.N. (Retired); President, Cooke Engineerng Company; Senior Member, Institute of Radio Engineers, and JOHN MARKUS, Assocate Editor, *Electrontes*.
433 pages, 5¾ x 8¾, over 600 Illustrations, $6.50

This comprehensive glossary should be of constant usefulness to electronics engineers, and to all who refer to electrical engineering terms in the course of their work. The definitions have been so written as to be of value to the most elementary technician or to the advanced radio engineer. Each definition is not only precise and accurate, but, in most instances, complete in itself.

Comprehensively covers terminology in the fields of

Radio
Television
Industrial electronics
Photoelectric controls
Safety devices and intrusion detectors
Medical electronics
Communications
Facsimile
Sound recording
Electronic heating
Electronic welding
Electronic motor control
Long-distance telephone and telegraph
and includes as well available material on
Military electronic equipment
Radar

Order from
EDUCATIONAL DIVISION

Telephone Engineer Publishing Corp.

the Convention sessions, President Reynolds missed many events which made the Michigan convention unusual. The absence of displays by manufacturers and suppliers was probably the most unusual feature of the gathering which attracted the largest crowd in the Association's history. Despite the lack of a "trade show," the conventioneers were enthusiastic about, and appreciative of, the fact that the Associate members provided carriage tours, Island fudge, and beautiful corsages for nearly 150 women who attended, as well as attractive anniversary gifts for an unusual group of guests.

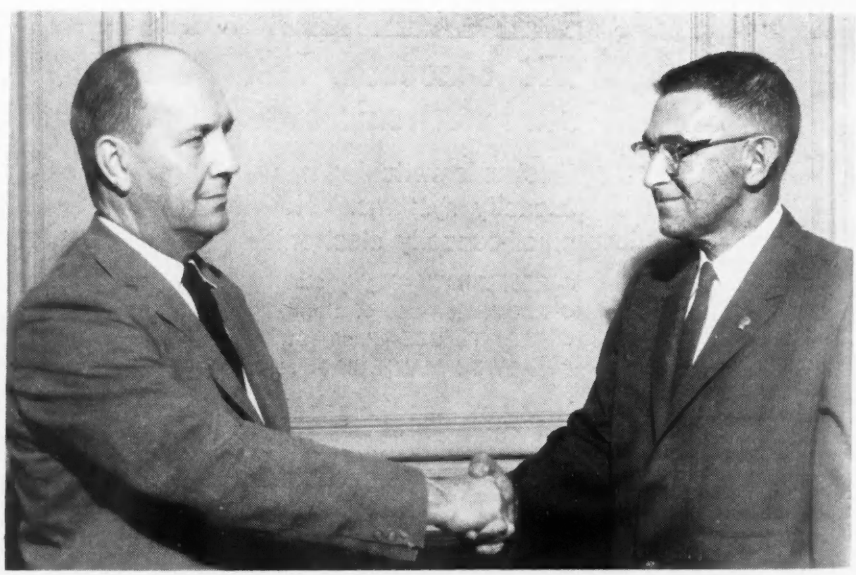
President Reynolds was the only living past-president of the association who was absent from the banquet given to honor an industry group for their contributions to the association's successful growth. The past presidents, who were given personalized desk barometers, and who were presented at the banquet with their wives were: H. R. Christianson of West Lafayette, Ind.; Ben C. Schweitzer, recently returned from Formosa; E. R. Vaughan of South Haven; R. E. Putnam of Muskegon; R. J. Schafer of Pinconning; Don K. Carlson of Morenci and C. Reginald Smith of Port Hope. The awards were made by Austin Saunders, president of General Telephone Co. of Mich.

During the banquet, similar recognition was paid John Sattler of Cedar, only living member of the group incorporating the Association; P. E. Taylor of Pickford, only living member of the association's original board of directors; and R. H. Burfeind of Chicago, who was honored as "Dean of the Suppliers" as he completed his 61st year of service to the telephone industry. Taylor's life was summarized in a poem entitled "Pat," composed by H. Grant Iler. Bell-Independent head.

In the absence of President Reynolds, John Collver, Climax, who assumed the full executive responsibility during the president's illness, introduced the association's new President, K. B. Sage.

Mr. Sage, who has been a member of the board of directors since 1946, is manager of the Traverse Bays Telephone Co., which operates eight exchanges in Michigan's northwest section. He succeeded his father B. R. Sage who was a member of the association's original board of directors. During his tenure as director, Mr. Sage has been chairman of virtually all committees of the association. In addition to his telephone responsibilities Mr. Sage is past president of Central Lakes Lions Club, a director of the Michigan Accident Fund and an avid sportsman and hunter.

Re-elected to the board of directors for three-year terms were: Ed. Cadwell, Levering; K. W. Benckert, Muskegon; John Collver, Climax; and



Guiding the Michigan Independent Telephone Association into its second quarter century is president-elect K. B. SAGE, president of Traverse Bays Telephone Co., being congratulated on his election by C. D. McLELLAN, executive secretary.

John Fox, Waldron. Other members of the MITA board of directors are: R. J. Schafer, Pinconning; L. W. Reynolds, Ontonagon; John Sattler, Cedar; Art Nickless, Millington; Al Spry, Howard City; K. B. Sage, Central Lake; D. K. Carlson, Morenci; and P. E. Taylor, Pickford.

In addition to the election of Mr. Sage to the presidency the following officers were elected by the board: Vice President, P. E. Taylor; Vice President, John Collver; Treasurer, K. W. Benckert; Assistant Treasurer, Glen Swartzlander; Assistant Secretary, Margalee Magoon; Executive Secretary, C. D. McLellan.

Golfers in the association were not only busy on the course but in the meetings as well where the permanent award of the J. H. Fairman trophy which has been awarded annually to the tournament champion was given permanently to D. C. "Gibby" Gibson of Leich Sales Corp., who has been a six-time winner. A new Anniversary trophy provided by Harris-McBurney Co. was won by H. E. Scott of the L. M. Berry Co.

Ferry Allen, assistant vice president-operations, Michigan Bell Telephone Co., an associate member of the Association, opened the first General session of the convention by reading a letter to L. W. Reynolds from Wm. Day, president of Michigan Bell, commending the association on its growth in a quarter century.

Sealing & Caulking Compound

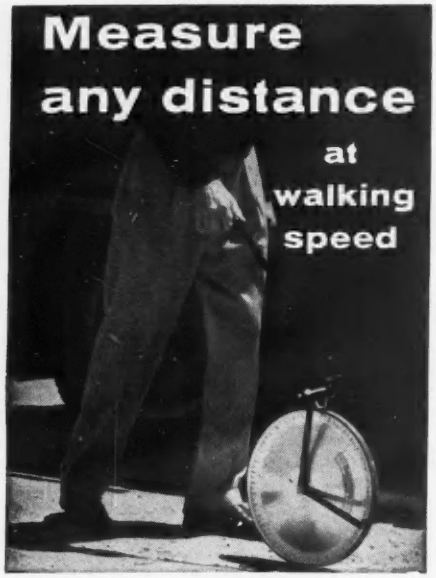
DUXSEAL, an all-purpose sealing and caulking compound for a variety of industrial and electrical applications, is described in a 4-page brochure published by Johns-Manville.

The brochure, IN-318A, gives the characteristics of the asbestos-based, non-hardening sealer, which was originally developed for use by electric power and telephone companies for sealing duct openings.

The back cover contains a description of J-M Volseal, a premium sealer for use in sealing primary electrical connections.

Copies of IN-318A are available from *Johns-Manville, 22 East 40th Street, Dept. TE&M, New York 16, New York.*

HIGH IN QUALITY
WB TELEPRENE® Drop Wire
For fourteen years, original installations of WB Reinforced TELEPRENE® Drop Wire have been in service without showing signs of wear. Wire that stands up that long demonstrates true quality . . . and real economy.
WB
WHITNEY BLAKE CO.
NEW HAVEN 14, CONNECTICUT
Telephone CHestnut 8-5515
TWX: NH 84



records 100,000 ft.
automatically!

It's So Easy to measure with a Rolatape ...and you save time on every estimating job...no tapes to wind, no helper is required. You get precision-accurate measurements every time.

Records Feet automatically and the accumulated total is always in full view.

Shows Inches, and Fractions of an inch. Wheel is calibrated in inches and fractions for quick easy reading.

Shows Tenths of a foot. Wheel is calibrated in tenths on reverse side for engineers.

There is a variety of Rolatape Models to suit your needs. See them at your local dealers.

Write for information and name of local dealer today!

Rolatape, Inc., 1741 14th St., Santa Monica 2, California

Rolatape
Measuring Wheels

"Direct Distance Dialing"

(Continued from page 33)

convinced they are not like the youngsters in grammar school. They tell the story of a man who finally realized a lifelong ambition — to return to the grammar school he had attended as a boy and make a speech.

He started out in the accepted oratorical manner. "When I see your smiling faces before me, it takes me back to my childhood. Why is it, my dear boys and girls, that you are so happy?"

At this point he paused to let his words sink in, to let his youthful audience ponder over this weighty but purely rhetorical question.

To his dismay, however, a grimy hand in the front row began to wave frantically and there was nothing to do but recognize the lad. "Well, son, tell us the answer if you think you know it."

"The reason we're so happy" grinned the boy, "is if you talk long enough we won't have a geography lesson this morning."

That is not the case as far as your employes are concerned: — they want to know what is being done and why, and are not interested merely because they get a "break" from their regular duties.

The second phase of "Operation Direct Distance Dialing" is the two months preceeding the establishment of the Service. Of course this time table may vary some, according to the number of exchanges which are to be converted to the new service. It might require a week or two more, or less. In this phase we include our advertising program which is designed to explain all phases of the operation of Direct Distance Dialing.

In addition, we use weekly releases in our newspapers, reporting the progress which is being made and don't forget that old saying — a picture is worth a thousand words. Our releases include pictures of some activity in connection with the new service and create interest in the program.

It is during this period that we visit our PBX and heavy toll users, and present programs to every club or organization that will invite us to meet with them, and we actually ask for invitations.

For these meetings we prepared two programs, one which could be presented to Service Clubs where very often 20 minutes is all of the time allotted, and a second one which could be used when more time is available. The lectures were demonstrations and dealt with the over-all plan of Direct Distance Dialing, how to use it, and also explained how subscriber's statements would be prepared.

In scheduling these meetings we included city and village councils and the schools among the first. As for the councils, it is a matter of courtesy, and in the case of the schools we recognize that these young people are the telephone subscribers of tomorrow. More than that, carrying the message home helps create interest among the parents. We know some parents attended meetings because of their children. It is our opinion that the programs presented to the various organizations such as Service Clubs, civic, church and farm groups was a most important part of the educational program.

"The Telephone Story"

AS TO the advertising, we used simple homespun ads which, we called "THE TELEPHONE STORY." They are all planned in advance and each one deals with some particular portion of the operation of Direct Distance Dialing. We use them for educational purposes and depend upon our news releases to attract interest and create a favorable reaction toward our company.

As we approach the time for the new service we hold a second meeting with all employes. This might be termed a "refresher" course. We want to be sure that all employes are in a position to answer any questions they might be asked.

During the last two weeks before

Direct Distance Dialing goes into operation there are three mailings to each subscriber. The first is a leaflet and a dial sticker to be placed on the telephone. The dial sticker contains the new number and the Direct Distance Dialing code number. I am sure that many of you are familiar with these stickers which can be placed over the existing dial plate without removing the one in use.

The leaflet explains that the telephone number is being changed to conform to the nationwide numbering plan which is necessary when Direct Distance Dialing goes into operation. It also tells about the faster and more convenient service which they are soon to receive. Perhaps it should be mentioned at this point that we have had excellent results in the use of the dial sticker and it certainly saves a great deal of time and expense.

The second mailing is a personal directory which contains complete information as to the use of Direct Distance Dialing, list of dialable points in the Home Dialing Area, and a list of cities and area numbers from the most frequently called points in all parts of the nation.

In the case of our Medina area we mailed to all subscribers a second or revised list of points in their Home Dialing Area and in other parts of the country a year after the service was placed in operation. The third mailing was, of course, the new telephone directory. It contains information pertaining to Direct Distance Dialing, but we relied for the most part on the booklet which was the second mailing delivered about one week before the date designated as "DDD Day." The directory was delivered about one week before the conversion date.

The day before "DDD Day" we invited our editors to the toll center exchange and gave them a "sneak preview" of the new service, and allowed them to make a call by this new method. We were given some nice stories about the service, and I am sure that this act did not hurt our standing with the press.

And then comes the long awaited

PARSONS® 77 TRENCHLINER®

DITCHES, LAYS CABLE
for 1½¢ per foot

A cable installation department of a major telephone company recently cut cable laying costs of 5 to 9 cents per foot down to 1½¢ per foot with a 77 Trenchliner. Results such as these are not unusual with the 77.

Here's why...

SPECIAL CABLE LAYING DEVICE — rubber wheeled cable feeder protects cable, lays it down in ditch automatically as 77 moves ahead.

BIG CAPACITY, SMALL DIMENSIONS — the 77 delivers up to 21 lineal feet of trench per minute, yet isn't much wider than a yardstick. Ideal for close-quarter work.

DIGS TO 5′ DEPTHS, 6″ to 18″ WIDE — ladder type boom starts cut fast, holds accurate grade. Vertical set-in work, and undercutting is no problem. P25

PARSONS COMPANY
NEWTON, IOWA
A Division of KOEHRING Company

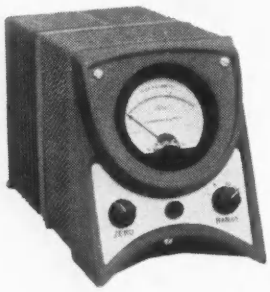
Look at the many different

POWER MEASURING INSTRUMENTS

Sierra offers you now

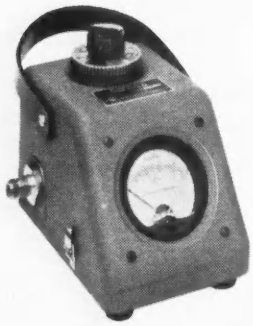
Model 160 50 ohm Coaxial Loads

Now including Models operating to 11 KMC, Sierra 160 Series low VSWR terminations may be used when stable 50 ohm loads are required. Featuring rugged design, high stability at full rated power, the loads have a typical VSWR of 1.2. All models are air-cooled and complete shielding insures personnel safety. Models with power capacities of 1, 5, and 20 watts are available with N, C and BNC connectors. 100 and 500 watt models Type N connectors. $20.00 to $170.00



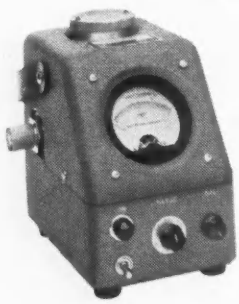
Model 185A Average-Reading Termination Wattmeters

Sierra 185A series are particularly useful in terminating rf coaxial transmission systems, measuring average powers between 20 and 1,000 MC, and as dummy loads for testing and adjusting CW and FM transmitters and oscillators. Three models with maximum power dissipation of 15, 100 and 500 watts, and power ranges of 0 to 5/15, 0 to 30/100 and 0 to 150/500 watts, respectively. Accuracy is ± 5% and VSWR is 1.2. Female Type N connectors. Model 185A-15FN, $170.00; 185A-100FN, $260.00; 185A-500FN, $315.00.



Model 164A Average Power Monitor

Sierra 164A Series Bi-Directional Power Monitors are now available with plug-ins down to 2 MC. Four plug-ins provide full scale ranges of 1, 5, 10 and 50 watts through frequencies 25 to 1000 MC. Two medium-power units provide full scale ranges 10, 50, 100 and 500 watts, 25 to 1000 MC. Two high-power units provide full scale ranges of 50, 100, 500, 1000 watts, 2 through 75 MC. Model 164 is now available with Type N, C, HN, UHF and LC connectors. Model 164, $115.00; plug-ins, $70.00 to $170.00.



Model 194A-A Bi-Directional Peak Power Monitor

Covering 200 to 1,215 MC, Sierra 194A-A Peak Power Monitor offers two important, time-saving features—peak power is read directly without computation and a reversible directional coupler permits incident or reflected power readings simply by turning one knob. Peak powers to 30 Kw are covered in 4 ranges. Measurement accuracy is ± 10% full scale at pulse widths down to 0.1 μsec or repetition rates as low as 10 pps. Minimum duty cycle 0.04% for specified accuracy. $460.00.

Data subject to change without notice.
Prices f. o. b. factory.

For complete details, see your Sierra Representative or write direct.

sierra

SIERRA ELECTRONIC CORPORATION
A Division of Philco Corporation
6563Y Bohannon Drive • DAvenport 6-2060 • Menlo Park, California, U.S.A.
Sales representatives in all principal areas.
Canada: Atlas Instrument Corp., Ltd., Montreal, Ottawa, Toronto, Vancouver.
Export: Frazar & Hansen, Ltd., San Francisco, California.

6562

day — Direct Distance Dialing has arrived but our work is not yet completed. We wonder, will they use this new service? Will they like it? Would they like to see all of the equipment necessary to provide the service? So it is decided to hold an Open House. At the open house the equipment has appropriate signs which tell just *what* it does, and may I emphasize we do not try to tell *how* it does it. People are interested in knowing *what* the equipment will do, but not *how* it is able to do it. They are also impressed by the tremendous amount of equipment necessary to provide modern telephone service. It is a good time also to prepare exhibits showing the part IBM equipment plays in this operation. And it is always appropriate to exhibit the equipment which we have to sell, the equipment which makes good telephone service even better. It is another subject entirely when we think of Open House, so I am merely mentioning it as being worthwhile after the inauguration of Direct Distance Dialing.

After cutover to DDD we planned a series of ads which point out that this new service is faster, and it is cheaper — three calls for the price of two. These ads were prepared through use of the facilities of Telephone Advertising Institute and were a part of the post conversion program.

This is also a good opportunity to secure fine feature stories showing prominent persons using Direct Distance Dialing and commenting on its value to them.

I am sure the question in your mind is — "How well did the program work for you?" I once asked a Public Relations Expert, "how do you know whether or not you are being successful when you are dealing with intangibles?" His answer was, "Perhaps you can't tell if you are being successful. but you will certainly know it when you make a mistake."

I believe you can evaluate what has been accomplished in an educational program such as we have been discussing. The answer lies in whether it is being used, what people think of it, and does it increase the use of

Send for complete specifications on the NEW Model 600 PM as well as the story of cable pressurization and its surprisingly low cost — all included in "The Puregas Cable Pressurizing Catalog."

keep them talking, rain or shine

with the NEW Model 600 PM on the line

Puregas' newest air dryer is a little fellah with a lot of lung power. Although small enough to be installed on telephone poles, this Puregas tiny-mite's no pipsqueak. It delivers 600 cubic feet of dry air per day to provide continuous pressure protection for cable systems.

Fully automatic, the Model 600 PM is an ideal pressure source for small exchanges or as a booster for aerial plant running considerable distances from central offices. Pole mounted in remote locations, it will maintain effective minimum cable pressure levels toward the cable ends and back to the central office pressure source.

Encased in a weatherproof cabinet, this rugged unit delivers its 600 cubic foot capacity of dry air at adjustable pressures from 0 to 15 psig, within an ambient temperature range of —40°F to 120°F. The Model 600 PM is supplied as a complete unit. It comes equipped with air compressor, refrigeration drying circuit, alarm facilities and pole mounting hardware.

PUREGAS EQUIPMENT CORP.

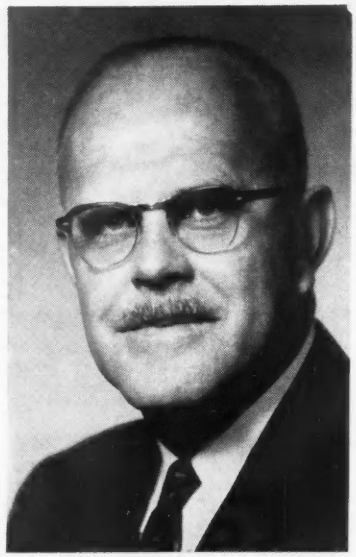
PEC

578 OAK STREET, COPIAGUE, L. I., N. Y.

Pole-to-pole or underground, Puregas gives cable protection all around
...TO KEEP THEM TALKING.

long distance service. Bear in mind that we are presently providing Direct Distance Dialing for station-to-station calls only. Here is our experience: — At Medina after one month 40 per cent of all toll traffic was completed by subscribers dialing directly. After three years of Direct Distance Dialing 69 per cent of all toll calls are being dialed by the subscribers. The percentage varies by exchanges from a low of 52 per cent to a high of 83.7 per cent, with the average 69 per cent.

In our installation at Norwalk, which has been in operation only two months, the percentage of all toll traffic dialed to completion by subscribers was just over 48 per cent at the end of the first two weeks but has now, at the end of seven weeks, reached 56 per cent. In the case of Medina we did not keep a record initially of the percentage of dialable calls which were dialed by the subscribers, but we are keeping such a record at Norwalk. This record shows that the subscribers are completing 88 per cent of all dialable toll calls. And this certainly is evidence that people like the service and are using it.



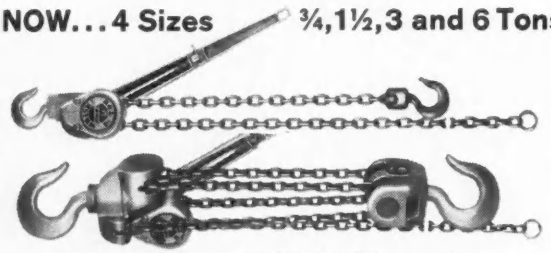
Speaker PAUL H. KAUFMAN, director of public relations, Northern Ohio Telephone Co., presented this paper at USITA's 1960 Commercial Conference.

It has long been recognized that the better the service, the easier it is to use, the more people will use it. In the case of Medina, however, the figures do not tell the entire story for this city in the highly developed industrial area of northeastern Ohio has had phenomenal growth and an extremely high rate of toll usage. Even so the increase of toll usage since Direct Distance Dialing went into operation in that area is four per cent above the increase in the other areas in which we operate. There is every reason to believe Direct Distance Dialing will produce a higher percentage of increase in most other areas.

Now I would like to summarize a bit and emphasize some of the important phases of the program. We repeat — the success and acceptance of Direct Distance Dialing depends to a great extent upon subscriber education. You may find better methods than we have outlined, but consider it carefully and make certain that your subscribers are informed about

New ¾-ton Type "C" Pull-A-Way

NOW... 4 Sizes ¾,1½,3 and 6 Tons



WRIGHT Type "C" Pull-A-Ways make easy work of hundreds of quick hook-up jobs. Now available in four sizes—¾, 1½, 3 and 6-ton—Type "C" Pull-A-Ways are portable, safe and rugged. Corrosion-resistant modern aluminum alloy castings are used for gear case, handle and covers of all models. Hooks, load chain and chain sheave are made of alloy steel. Positive, dependable load brake securely holds load at any point. Lubricated for life. Weights: ¾-ton, 12½ lbs; 1½-ton, 23½ lbs; 3-ton, 36½ lbs; 6-ton, 63 lbs.

Write to our York, Pa., office for Bulletin DH-56

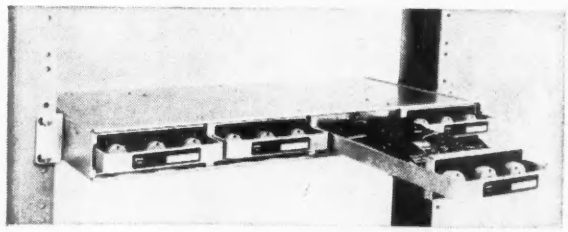
WRIGHT HOISTS

Wright Hoist Division • American Chain & Cable Company, Inc. ACCO

York, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

Budelman Carrier Microwave

VOICE FREQUENCY REPEATER



The Type 251A Voice Frequency Repeater is designed for use on wire lines to amplify voice frequency signals. Its two transistor amplifiers provide up to 20 db gain in each direction. It draws only 3.4 milliamps from a 12, 24 or 48 volt battery. Four of these compact repeaters fit on one mounting shelf. Easiest to adjust . . . no test equipment required.

Also available for use on loaded cable.

Write for Technical Literature

BUCKEYE TELEPHONE & SUPPLY CO.
1250 Kinnear Rd. • Columbus 21, Ohio
Phone—HUdson 8-0655 (Area Code 614)

the value and use of the service.

Emphasize that it will save them time and money. Be enthusiastic in discussing the service — some of your enthusiasm will "rub off" on the people with whom you are talking. You may have noticed in this discussion I have not referred to Direct Distance Dialing as DDD. In our first experience with the service we thought it important to emphasize the importance of dialing the DDD code number first because that connected the subscriber with the Direct Distance Dialing equipment. Some subscribers took us literally and attempted to complete their calls by dialing the letters DDD and of course failed in their attempts.

Since then we refer to the new service as Direct Distance Dialing. We are also glad to see the changes to All Number Calling for some subscribers thought the name was being abbreviated and did not approve of the first two letters which were a part of the telephone number.

Here is an example of what I mean: One exchange was given the name PARK which meant the prefix was PA. Some subscribers insisted it should have been PK. I am sure all number calling will be a decided improvement over the 2L-5 numbering plan.

"Look To The Future — And Plan For DDD"

WE can all be assured that Direct Distance Dialing will become almost universal within the next few years. It is part of a program which has for its goal that same day, from any telephone we will be able to dial directly to any other telephone in the United States — Yes, and in the not too distant future we will be dialing directly to telephones in foreign lands. It is well for us to look to the future and to plan for Direct Distance Dialing. And remember, your education and Public Relations Program is of the utmost importance for it will make it possible for both subscribers and companies to derive quickly the maximum benefits from Direct Distance Dialing. — *Paul H. Kaufman.*

FOR THE BEST IN DISPLAYS, LOOK TO GLADWIN!

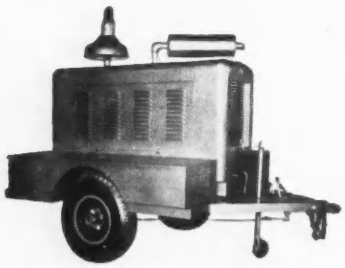
The Most Wanted Line of display items in the telephone industry! Sell telephones for Christmas with stunning new displays from Gladwin Plastics! Any time of year, *The Most Wanted Line* will boost sales in all types of telephone services! Write for our display brochure.

GLADWIN PLASTICS, INC.
165 COURTLAND STREET N. E.
ATLANTA 3, GEORGIA

There's VERSATILITY in TELEPHONE SYSTEM SERVICE and Portability with...

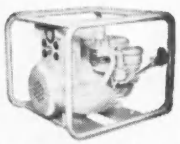
U.S

Complete "versatility" is possible for telephone system service with portable U.S. Versa-Trailer standby emergency power units in sizes from 10 kw to 35 kw capacity.



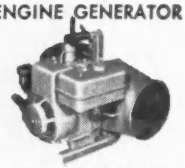
Units provide both single phase power for lights and 3-phase power for other needs. Many exchanges in an area can be served by a single unit.

Telephone systems use U.S. portable generating sets for on-the-spot power needs. Sizes 750 watts and larger, air-cooled.



ENGINE GENERATOR

Portable engine blowers provide convenient means of furnishing fresh air to manholes, or for ejecting smoke, fumes, etc.



ENGINE BLOWER

Motor driven blowers like engine driven counterparts, are invaluable for exhausting contaminated air.

MOTOR DRIVEN BLOWER

for complete information write . . .

UNITED STATES MOTORS CORPORATION
LIGHT U.S. POWER
OSHKOSH · WISCONSIN

UNITED STATES MOTORS CORPORATION

110 W. 5th Ave. / Oshkosh, Wis.

Automatic Message Composer

(Continued from page 35)

diodes, which are considered more economical and reliable, were used in the production models. Each diode corresponds to one of the switches on the transmitter distributor.

In order that the proper character be selected in the correct sequence, a method of sequential selection, which is the heart of the message composer, is necessary. This is accomplished by means of the second section, a 25-position, 10-deck stepper switch. This stepper switch, in conjunction with a patch panel, programs the message to be sent.

To determine which of two types of messages — either the surveillance message or the test message — and to start and stop the unit, control circuitry is provided in the third section. This control circuitry consists of two multicontact relays, a four-deck, 10-position stepper switch and two SPST momentary contact switches.

The fourth section is the automatic time unit. This unit inserts the correct time, in four digits, into either the surveillance or test message. The last major part of the composer is the rotary selector switches which enable the operator to select variable functions within the surveillance message.

Typical Operation

WHEN the operator presses the Transmit Message switch, (*see Figure Three*) a relay in the control circuit closes and locks. This relay in turn actuates the latch magnet on the transmitter-distributor, which starts it revolving. Once during each revolution of the transmitter-distributor a microswitch connected to the shaft of the rotor advances the main stepper switch one position. Tracing the loop current, one lead of the loop circuit is connected through the control circuit relay to the control stepper switch. It then passes through the main stepper to the specific diode grouping desired and back to the other side of the loop.

It will be noted from *Figure Three* that the loop current can take one of three paths to the diode groupings: directly, through the rotary selector switches or through the automatic time unit.

There is an auxiliary circuit which branches off of the automatic time

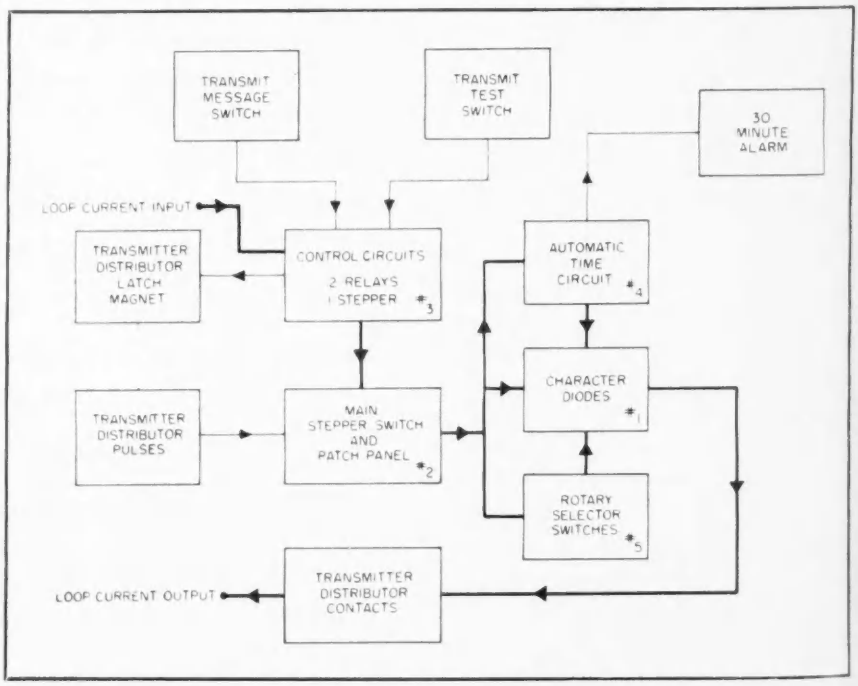


FIGURE THREE: — Block diagram of DEW Line message composer.

y utility engineers now specify

POWER CABLE NSULATED WITH MONSANTO POLYETHYLENE

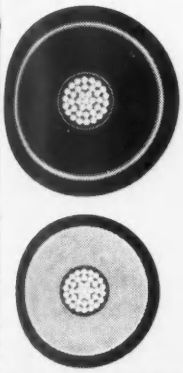
• better abrasion resistance • lower power factor; less power loss in transmission • low surface tracking • excellent moisture resistance • less bulk, less weight

Leading manufacturers now produce power cable insulated with polyethylene based on Monsanto Polyethylene resins, specially developed and perfected by Monsanto. For complete technical data including applicator's information, write to Monsanto Chemical Company, Plastics Division, Room 730, Springfield 2, Massachusetts.

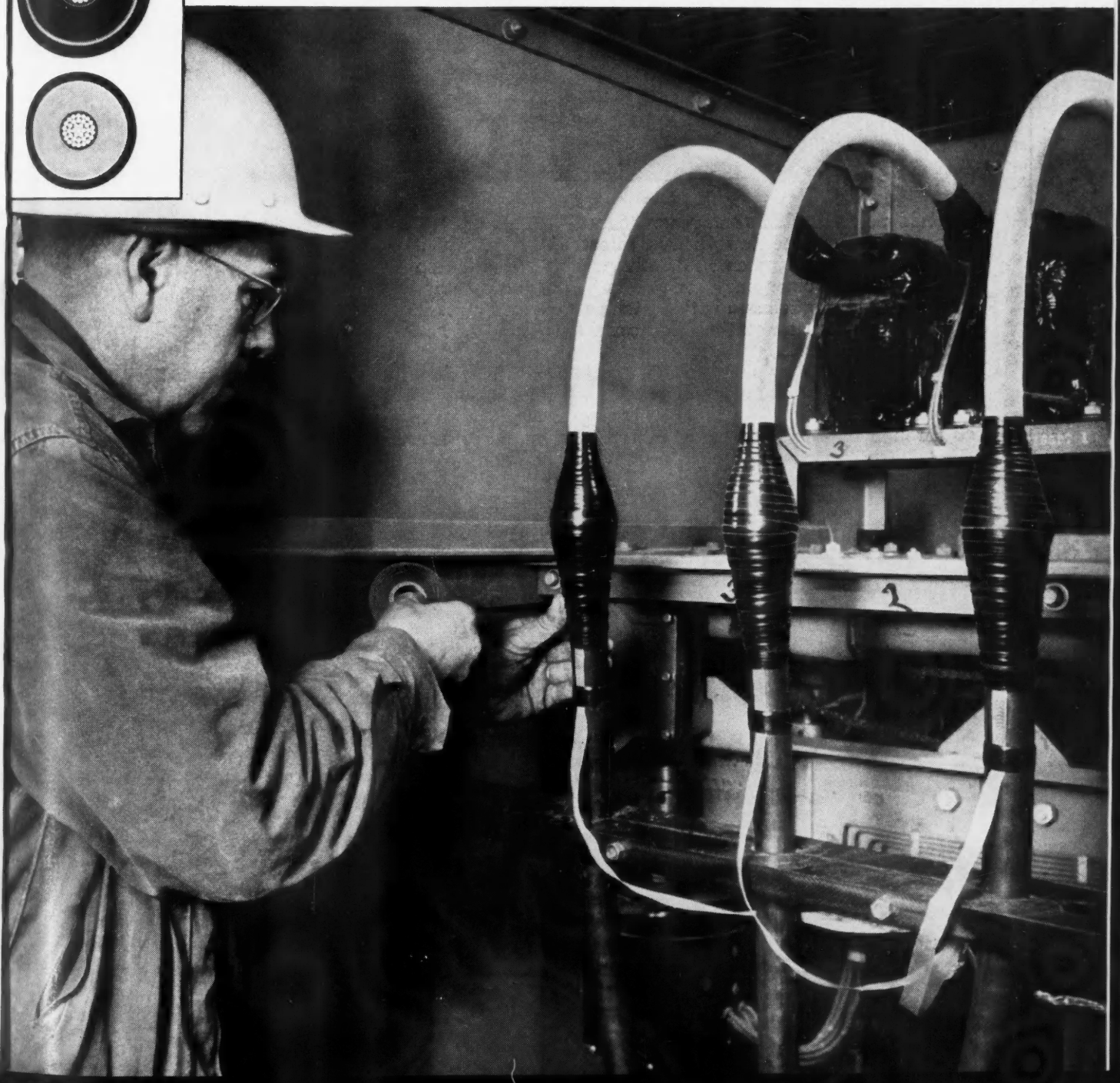
Monsanto

MONSANTO ACTIVATOR IN **PLASTICS**

e the slim shape and size of polyethylene-insulated cable er), compared to the old e (upper) being replaced.



New 15,000 volt polyethylene-insulated power cable installation at main sub-station, Monsanto Chemical Co., Plastics Division plant, Springfield, Mass. Installation-rated at 175 amps, 15,000 volts. 3-phase system, 1 conductor per phase. Conductors are 2/0-37 strand copper (133,100 circular mils). Insulation consists of: 1 layer semi-conducting tape, 297 mil polyethylene insulation, 1 layer non-metallic tape, metal shielding, 1 layer tape, 6/64″ vinyl jacketing.



Reliable emergency power for new OCDM requirements...

KOHLER ELECTRIC PLANTS

Kohler electric plants enable you to meet—fully, reliably, economically—the new OCDM directive covering civil defense radio equipment. The ruling requires installation of automatic emergency generators before radio equipment can be purchased with matching Federal funds. It applies to repeater stations and control positions as well as base stations.

Kohler stand-by plants with automatic transfer switch are fully packaged for immediate, unattended take-over of emergency loads. Kohler electric plants are known throughout the world for rugged, dependable service. Sizes to 100 KW, gasoline and diesel. Write for folder J-13.

MODEL 2.5R21, *2500 watts, 115 volt AC. Air-cooled, gasoline. Remote start.*

MODEL 5RM21, *5KW, 115 volt AC. Air-cooled, gasoline. Remote start.*

KOHLER CO. *Established 1873* KOHLER, WIS.

KOHLER OF KOHLER

Enameled Iron and Vitreous China Plumbing Fixtures • All-brass Fittings
Electric Plants • Air-cooled Engines • Precision Controls

unit. This is the alarm bell which rings every 30 minutes. The bell reminds the teletype operator to send his test message.

To examine this operation in more detail refer to *Figure Four.* The loop current travels from the transmitter-distributor stator "Stop" contact through Deck "A" of the control stepper switch. The control stepper switch is used to select, in sequence, the proper wiper of the main stepper switch. This is necessary because the surveillance and test messages are each approximately 100 characters in length and the main stepper has only 25 positions on each desk. Therefore, we must sequentially select four of the 10 available decks for a message.

From the control stepper switch, the current travels to a wiper of the main stepper switch. From there it moves to the specific contact of the stepper. In the position in which the main stepper is shown in *Figure Four*, the first character to be selected is "A." In this case the loop current will pass through the two upper diodes and back to character segments one and two of the transmitter-distributor. The current will flow only when the rotor is in contact with the specific stator segments. When the transmitter-distributor completes one revolution, the main stepper switch will advance one position. In this position the loop current will then flow through the wiper of the selector switch shown. The selector switch can be positioned in any of four positions: "A," "B," "E," or "I." In *Figure Four* the switch is set at "B."

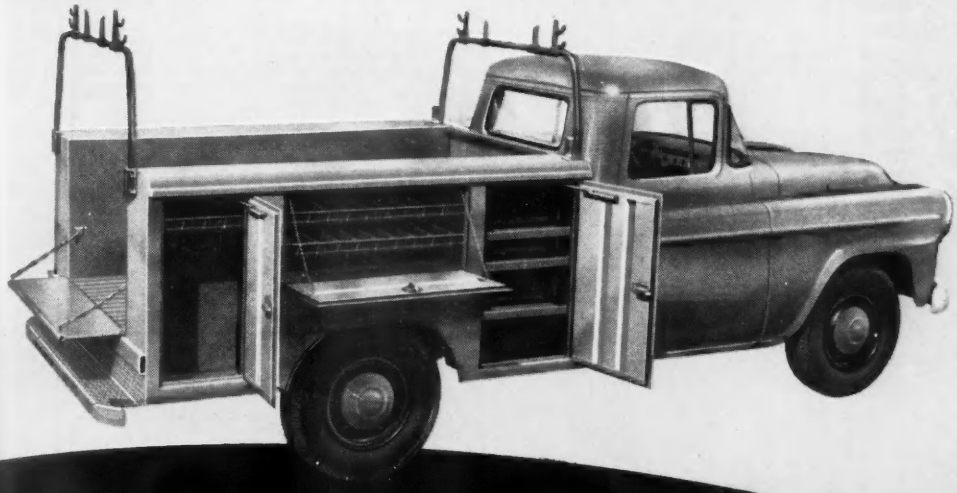
As the transmitter distributor completes another revolution, the main stepper moves on to the next position, this time selecting the function "Figures." On the next revolution it selects "I." However, since the previous character was "Figures," the numeral "eight" is printed.

This type of action will continue until the 25th position of the main stepper is reached. At this point, the "off-normal" contact on the main stepper switch will actuate the control stepper, which, in turn, will advance one position and connect the

Please turn to page 66

SERIES **22**

SERVICE AND MAINTENANCE BODIES



Four Models . . . Four Sizes

COMPARTMENTIZED TO FIT SPECIFIC JOB NEEDS

Which Series 22 Body do you need? Take a look . . . there's a model especially designed for your particular type of service work. The durable, all-steel unit shown above, equipped with an optional overhead rack, is widely used for general service work in all operations. Other models for electric, telephone and gas service have similar compartments fitted with various shelves and bins to meet specific work needs. Result: You get a custom-made body at a mass-produced price . . . plus increased crew efficiency on every job.

Series 22 Body features include flat, 16-gauge compartment tops . . . rust-proof, cadmium-plated door latches . . . nylon bushings in all door hinges . . . key-locking, weathertight doors . . . recessed, slam-action door catches . . . corrugated steel floor.

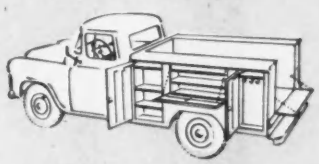
Available in 75″, 90″ and 104″ lengths, equipped with accessories to fit your particular need.

Need more storage space? Any of the four Series 22 models can be furnished with an all-steel superstructure. In addition to any optional items desired, the superstructure is fitted with two full-length shelves and three swivel hooks on each side, a window in the head panel and grab handles at the rear.

Self-Elevating Ladder Assembly

This time-saving assembly with six rubber-covered rollers and four powerful coil springs enables one man to quickly and effortlessly erect a ladder up to 36′ in length. The operator lightly pushes the end of the ladder down, and the springs do the lifting. Stowing is equally fast and easy. Ideal for use on 75″, 90″ and 104″ bodies. Includes 28′, 30′, 32′, 34′ or 36′ two-section extension ladder.

FOR ELECTRIC WORK

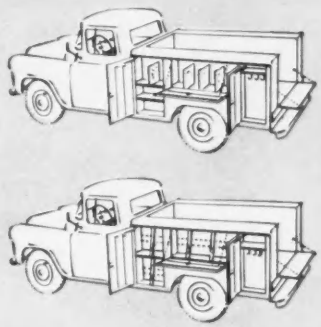


Series 22-E. Designed for service work in any phase of the electric utility industry. Special shelves and bins carry all the equipment and materials needed in the field.

FOR TELEPHONE WORK

Series 22-T. Compartmentized to carry a variety of telephone service tools, parts and materials. Standard arrangement of shelves and bins enables crewmen to quickly find items needed on the job.

FOR GAS WORK



Series 22-G. Two variations of this model are available for carrying either cast or tin meters. Rubber-padded compartments insure the safe storage of fragile parts and instruments.

Plenty of additional bins, shelves and racks carry tools, pipe, fittings, parts and all other equipment needed on routine or emergency service and maintenance calls.

Another reason why
UTILITIES EXPECT MORE FROM

POWERS *American*

UTILITY BODIES AND EQUIPMENT

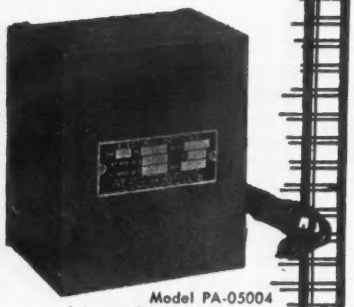
McCABE-POWERS BODY COMPANY

5900 No. Broadway ST. LOUIS 15, MO.	625 Cedar Street BERKELEY 10, CALIF.	1461 E. Washington Blvd. LOS ANGELES 21, CALIF.	5525 S.E. 28th Ave. PORTLAND 2, ORE.

BE SU-RRR-E!

Make SCHAUER your source for dependable DC POWER!

SCHAUER is recognized by the Telephone Industry throughout the world as a leading manufacturer of battery eliminators and battery chargers for almost every DC power requirement. You *save* with Schauer—on low first cost, low operating cost, and reliable service. See your Jobber or write for Bulletin No. 1470.



Model PA-05004
Schauer Battery Eliminator

Here's a sure SCHAUER power source for the operator's circuit on magneto switchboards

Schauer Type PA-05004 Battery Eliminator delivers constant, hum-free direct current to the operator's circuit. Equipped with relay for automatically transferring power to stand-by dry cells in the event of AC failure. Standard capacity is 4 volts DC at 0.5 amps. Steel case, for wall mounting is 5½"x6¼"x4".

Rectifier Division
SCHAUER
MANUFACTURING CORP.
4516 Alpine Ave., Cincinnati 42, O.

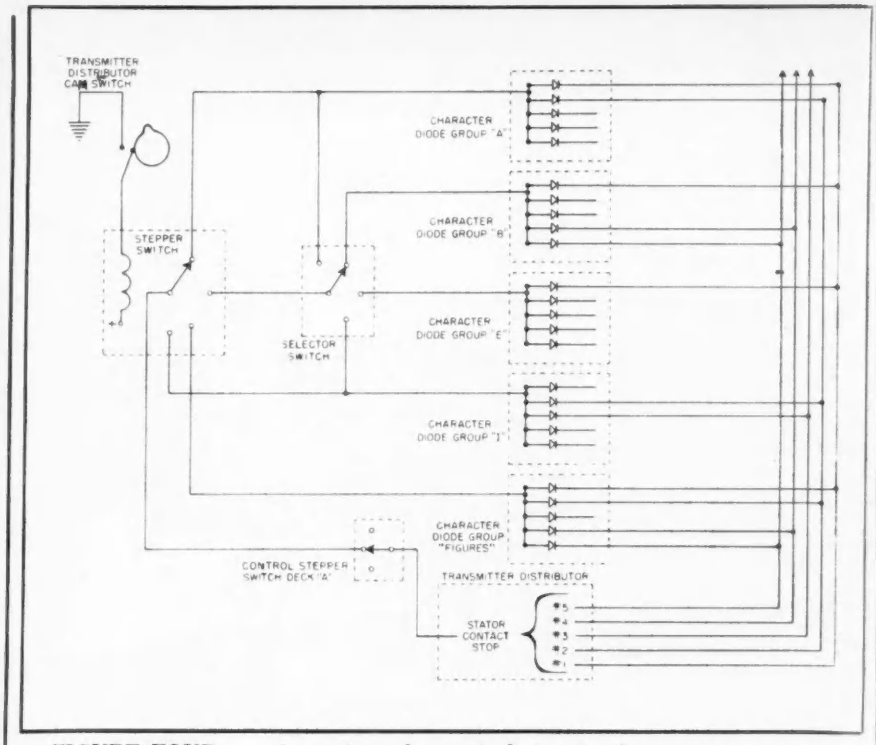


FIGURE FOUR: — A portion of a typical circuit of automatic message composer.

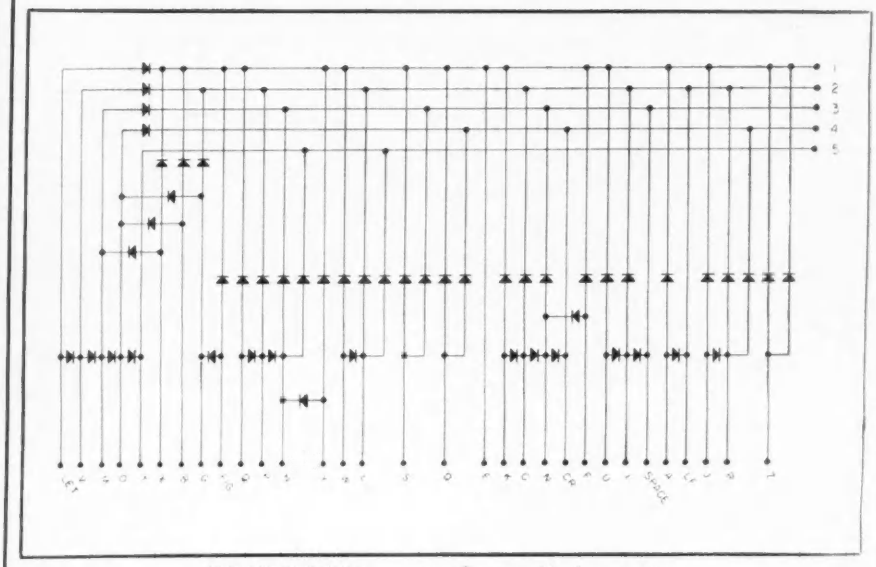


FIGURE FIVE: — A teletype diode matrix.

loop circuit to the next deck of the main stepper.

The main stepper will then advance through this deck, switch to the third and fourth decks in the same manner and proceed through the fourth deck until the end of the message is reached.

The stop function is controlled by another deck of the control stepper and the off normal and self-interrupt switches on the main stepper. Only four decks are used for the surveillance and test messages. By use of a patch panel, the message format and content can easily be changed without the necessity of rewiring.

At the present time this message composer is being used successfully on the DEWLine. Now that the urgency of resolving the original problem no longer exists, the basic design of the message composer will be sophisticated by using a diode matrix and printed circuitry as shown in *Figure Five.* — *H. A. Gross.*

New Products' Showcase

SUPPLIES And EQUIPMENT

By Dick Reynolds

Dialaphone

DIALAPHONE has announced a new system that enables a sightless person to dial a telephone automatically through the combined use of Braille and Dialaphone.

A blind person, who can read Braille, can easily use Dialaphone to make a telephone call by locating the line of Braille for the person to be called, lift the receiver for the dial tone, and then push the button on the automatic dialer. Dialaphone does the rest.

Dialaphone is a self-contained unit, placed alongside and connected to the telephone. Its electro-mechanical memory consists of a plastic directory tape on which the names and numbers of up to 850 persons can be listed. Each number is recorded by means of coded perforations. Because the embossing of Braille requires additional space, this limits the number of names and numbers to less than Dialaphone's normal capacity. Although the initial directory list is prepared at the factory, each instrument is equipped with a perforator to enable the user to enter new numbers conveniently.

When a person wishes to place a call by means of Dialaphone, all he does is line up the name of the party he is calling in the viewing frame in the front of the instrument, then lift the telephone receiver. At the dial tone, he pushes the single starter button and his number is dialed automatically, leaving the user free to adjust business papers, make notes or prepare for the conversation. The number is dialed swiftly and accurately automatically.

Dialaphone and Braille attachment.

DIALAPHONE, with its electro-mechanical memory that can accommodate up to 850 names and numbers including Direct Distance Dialing codes and numbers, Direct Inward Dialing system numbers, and ANC (all number calling), saves time in looking up numbers, eliminates dialing errors, and makes telephoning easier, more efficient.

Dialaphone will dial any number or combination of numbers that can be dialed manually, including direct distance calls across the nation, and also the new direct inward dialing system, as well as ANC, the all-number calling that is fast replacing prefixes.*Check NP* 534.

Carrier Equipment

COMMUNICATION carrier equipment offering from one to 600 channels in a fully transistorized multiplexing system has been announced by Lynch Communication Systems Inc.

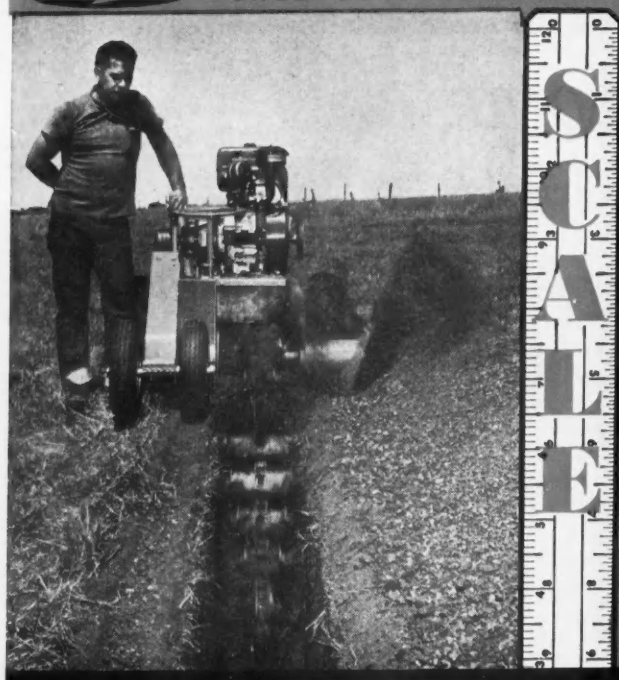
Designated as the B910 unit it provides reliability because there is no common equipment used in the basic 12-channel system. For instance, the individual channel carrier frequency is not derived from a common oscillator, thus oscillator failure will disable only one channel. The first 12 channels each have this individual equipment and up to 120 channels operate without equipment common to more than 12 channels.

Individual channels in the B910 cover only 4 kc of spectrum space due to single sideband, suppressed carrier modulation which has the advantage of reducing the loading on the microwave system to an absolute

DITCH WITCH TRENCHER

The measure of Success

CALL COLLECT



COMPARE

IZE: DIGS FROM 4" TO 16" WIDE AND UP TO 6' DEEP

OSTS: AS LITTLE AS 2c PER FOOT!

BILITY: JOB PROVEN!

IFE: AS HIGH AS ½ MILLION FEET!

ASE OF OPERATION: See a demonstration!

CALL COLLECT!

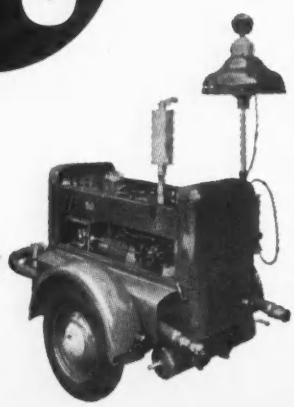
CHARLES MACHINE WORKS, INC.

697 BIRCH ST. • CALL COLLECT, FE 6-4404 • PERRY, OKLA.

be prepared

S&G

MOBILE POWER UNIT



order through your favorite distributor

for information, write or phone

S & G developed this amazing, versatile Power and Pumping Unit — now used extensively by telephone companies throughout the land. Its features include:

Generator (slow speed for *quietness*) — 2500 Watt, 110 Volt DC

Pump — 2800 GPH Diaphragm to remove seepage from drain back, can be operated from manhole by push button control

Air Compressor — to put cables under dry air pressure, operate air tools, for repairs and flash testing . . . plus 300-Watt floodlight to illuminate working area — buzzer signal for summoning helper — operates soldering pot, iron, electric and air tools — light, easy to handle.

S & G MANUFACTURING CORPORATION

DESIGNERS AND MANUFACTURERS OF SPECIAL EQUIPMENT FOR UTILITIES AND CONTRACTORS

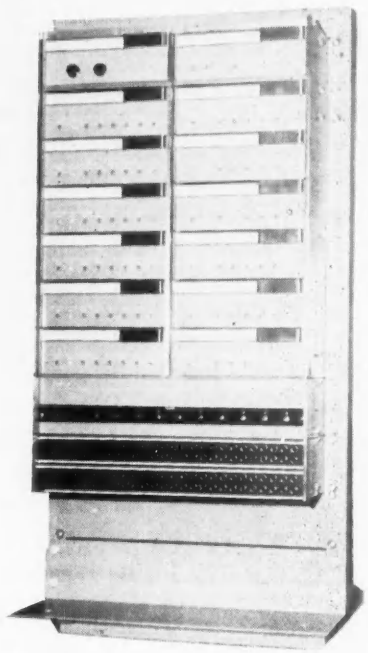
1017 Magazine St. • P. O. Box 1309 • New Orleans 10, La. • JA 5-3142

minimum and consequently providing optimum signal to noise advantages.

The Lynch B910 channels are stackable in groups of 12. Beyond the basic 12-channel group, expansion is progressive by group modulation in blocks of 60 channels to 600 channels. The basic 12-channel group is generated in a single modulation step for each 4 kc channel taking a total spectrum space of 48 kc between 60 kc and 108 kc.

The next additions are in groups of 12 channels. Up to 10 groups (120 channels) are positioned by group modulators to occupy individual 48 kc segments between 60 kc and 552 kc.

Expansion to 600 channels is easily accomplished in the B910 by repositioning the "super-groups" (of 60 channels each) after the first 120 channels have been installed, in accordance with the International Consultative Committee on Telephone and



Lynch B910 Communcation carrier unit.

Telegraph (CCITT) modulation plan to a segment about 2400 kc wide with a top frequency of 2540 kc.

The basic 12-channel system is translated directly to the microwave baseband without need for intermediate active pre-group equipment. This is made possible by a new Lynch filter design using quartz crystals in a unique ladder-type configuration. *Check NP* 535.

Planet-Gear Clocks

HAYDON Instrument Company has announced new Planet-Gear Clocks for split-second timing. Instantaneous snap-over of numbers is accomplished by a nylon cam and roller compensating device, which

moves the "always-in-mesh" planetary gear. This means all digits are in full view at the read line at all times.

Since the torque required to drive PlanetGear Clocks is uniformly low, the timing motors may be of the miniature series in various voltages and frequencies. Preset of hours and minutes is manual. The set knob on the side is geared to the seconds drum with a step-up ratio of 8 to 1.

The numerals are 3/8" high to MS-33558 (ASG), hot stamped, white on black for the hour and minute nylon drums, and either black or red on white for the graduations and numerals on the seconds wheel. Mounting dimensions are 2 7/8" by 2 3/8". Depth is 4" maximum. *Check NP* 536.

Transistorized Preamplifiers

A NEW series of transistorized preamplifiers is now being offered by Radiation Electronics Company, Division of Comptometer Corporation. Compensated from —5°F to 125°F, all preamplifier models have a noise

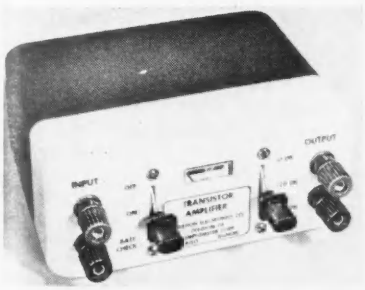
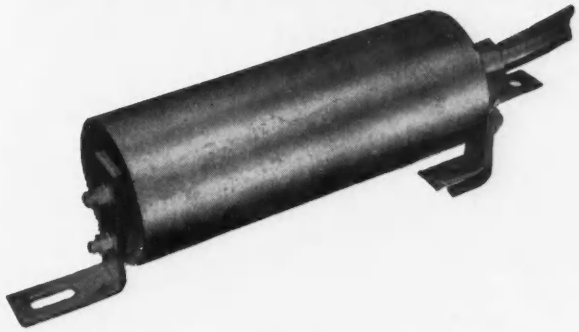


figure of less than 2 db, operate from self-contained batteries, and are provided with battery indicator.

CEECO TYPE C125
GALVANIZED STEEL CASE ASSEMBLIES
FOR AERIAL (POLE MOUNTING).
CONTAINING FOUR TO FOUR HUNDRED SIXTY COILS.



- LEAD STUB ASSEMBLIES ARE PRESSURIZED, AND
- PLASTIC STUB ASSEMBLIES ARE SEALED IN THERMOPLASTIC COMPOUND TO INSURE PROTECTION FROM MOISTURE.

These assemblies can be equipped with voice frequency coils, Types C632 (88 MH) and C638 (44 MH) coils are for subscriber loading, and Types C642 (88 MH) and C641 (44 MH) coils are for use on quadded inter-office and toll cables. Special coils can be made to meet other requirements.

Write us for assistance on your loading problems.

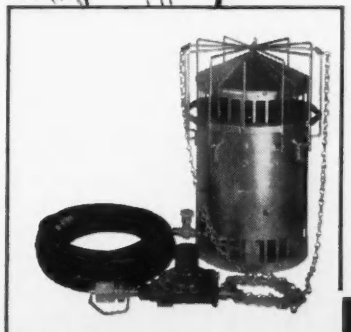
CEECO loading coils are sold by your telephone equipment supplier.

COMMUNICATION EQUIPMENT & ENGINEERING CO.

5646 West Race Avenue • Phone EStebrook 8-3109 • Chicago 44, Illinois

Heat that Tent Fast
with a
MO PE CO
propane
TENT HEATER

MoPeCo propane tent heaters give fast dependable heat to splicers working aerial cable in cold, wet and windy weather.



- Two sizes - 8,000 or 12,000 BTU
- 50 hr. maximum output, 20 lb. tank
- Two 4-ft. adjustable chains
- Low pressure regulator
- 30-ft. L.P. gas hose
- Weight: 9 pounds
- Size: 10" diameter x 14" high

Order through your favorite distributor

Write or call
MORRISON-PELSUE CO.
Denver, Colorado
2001 So. Bannock St. RAce 2-2834

The Model TA-4 preamplifier is designed for use with source impedances ranging from 5 to 24 ohms or 25 to 100 ohms and provides a maximum gain of 50,000 over a bandwidth of 10 cps to 50 Kc. Model TA-5 is used with source impedances of 100,000 ohms or less and provides a maximum gain of 1,000 over a bandwidth of 5 cps to 1 Mc.

Use of the TA-4 and TA-5 will extend the sensitivity of oscilloscopes, VTVMs and noise measuring instruments and will permit realization of near-ultimate performance of low and high impedance transducers. *Check NP* 537.

Spring Tension Gauge

P. K. NEUSES, Inc. has announced a new Spring Tension Gauge that has a range from 0 to 1200 grams in 100 gram steps, with range also shown in ounces and pounds avoirdupois from 0 to 2¾ lbs.

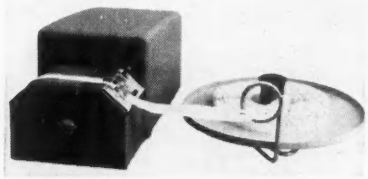
Called the STG-2-Z the scale is calibrated on front and back so gauge can be read left to right, as well as right to left. Unit is made of satin chrome steel frame with blued clock-spring indicator designed for rugged

use. Studs protect spring against damage. Frame is 6¾" long — over-all length 9½". *Check NP* 538.

Tape Unwinder

COMPTOMETER'S Western Apparatus Division has announced a new, portable tape unwinder. The unit eliminates manual rewinding and holds a 12-inch reel of up to 1,300 feet of chadless tape or up to 2,000 feet of fully perforated tape.

The unwinder feeds the leading end of the tape from the center of the



roll into a teletypewriter transmitter. Dimensions are: height 5 inches, width 12¼ inches (12 inch reel). The unwinder weighs 1½ lbs. *Check NP* 539.

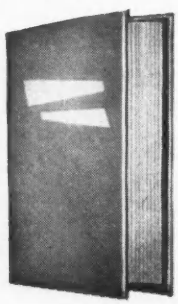
Pressure Sensitive Decals

THE ART PRINT Co. has announced a new series of decals designed for Independent telephone companies.

Made of Scotchlite, the decals come in three different sizes: 12" x 12" for cars, trucks, office doors, etc.; 6" x 6" for terminal box markers, stationary equipment, signs, etc.; and

HOW TO APPLY STATISTICS TO ENGINEERING DATA

—for more complete, accurate analysis



AIDED by this engineer's guide to practical statistics you can more fully analyze processing, research, and other kinds of industrial data. In plain terms it tells you how to apply statistical methods to engineering problems . . . how to correlate data . . . and how to treat experimental factors. Especially helpful, this easy-to-use book explains the technique of drawing the "best" line through data, and of accurately analyzing the variance. And—to round out your working knowledge of statistics—it gives you essential information on probability theory and frequency distributions. When you have a specific problem in statistical analysis, turn to the clear guidance, detailed examples, and more than 180 quick-reference tables in these pages.

APPLIED STATISTICS FOR ENGINEERS

By WILLIAM VOLK

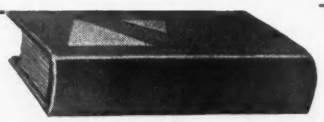
Senior Research Engineer, Hydrocarbon Research, Inc.

354 pages, 6 x 9, 27 illus., 181 tables, $9.50

Educational Division

TELEPHONE ENGINEER & MANAGEMENT

7720 N. Sheridan Rd. Chicago 26, Ill.



Fully explaining the fundamentals of

Semiconductor Physics

ELECTRONIC SEMICONDUCTORS

as related to rectifier and transistor problems

By EBERHARD SPENKE

Here is a rigorous and systematic introduction to semiconductor physics, developing the subject in a logical and consistent manner from simple concepts, and giving clear pictures of the conduction mechanism of electronic semiconductors within the framework of the *band model*.

The careful derivation of important relationships from precisely defined basic concepts and assumptions is one of the book's outstanding features. Others are the treatment of the acceleration of electrons; the treatment of the Zener effect; and the chapter devoted to statistics and kinetics of electrons as modified by electrostatic potentials. Germanium is the prototype substance used in all discussions of semiconductor behavior. All material on the conduction mechanism of semiconductors applies equally to thermionics, luminescence, and photoconductivity.

430 pages, 6 x 9, 163 illustrations, $11.00

Educational Division

TELEPHONE ENGINEER & MANAGEMENT

7720 N. Sheridan Rd. Chicago 26, Illinois

RESISTS OLD AGE

THANKS TO "YOUNG PROCESS"!

Kennecott's exclusive "Young Process" lead sheath does much to lengthen the life of Kennecott Telephone Cable. This sheath production method virtually eliminates oxides and impurities! Sheath is far more uniform in strength and burst resistance, with greatly reduced weld area. It provides increased protection against damage and aging. Cable retains full electrical properties over its long life!

IT'S KENNECOTT TELEPHONE CABLE

Send for free copy of new booklet on Kennecott UNIT TYPE Telephone Cable. It contains a wealth of information on the design specifications, mechanical and electrical characteristics and protective coverings available in Kennecott Unit Type Paired Exchange Telephone Cable.

KENNECOTT-OKONITE TELEPHONE CABLE

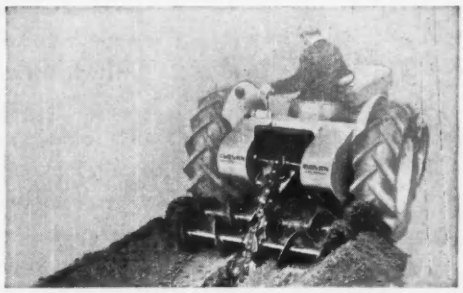
WHY IS AUBURN *THE* QUALITY TRENCHER?

Where it's manufactured?

Auburn Machine Works, Inc., established 1928, long known as the "House of Trenchers" is justly proud of its modern, precision equipped manufacturing facilities. Equipment that assures "Quality Controlled" production.

How it's manufactured?

AUBURN'S skilled craftsmen have a pride of workmanship that comes with years of experience, training, and study in the manufacturing of trenching equipment. Their expertness in the operation of precision machine tools and their thorough mastery of the measuring and testing devices used throughout each stage of production, is your guarantee of the quality of the AUBURN.



Job proven... Simple in design the Auburn Trencher is a perfect example of quality and ruggedness. It digs up to 800 ft. per hour—trenches 6" to 14" wide and down to 6 ft. deep.

Auburn owners, all over the world, have proven that quality means dependable performance and the most economical operation on all types of jobs.

AUBURN MACHINE WORKS, INC.

2035 South J Street, Auburn, Nebraska, U. S. A.

Please send complete information and name of nearest dealer.

*Name*_____

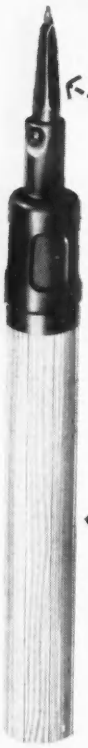
*Address*_____

*City*_____ *State*_____

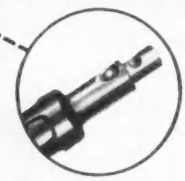
your best buy...

CHANCE LAMINATED PIKE POLES

here's why!

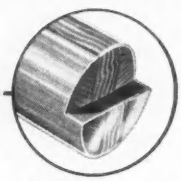


SAFETY POINT



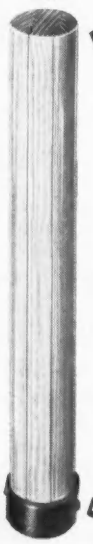
Gimlet point can be removed and reversed to prevent damage to equipment, to the point itself, and possible injury to workmen.

PLASTIC COATED

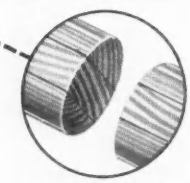


Chance Pike Poles are sealed in Maplac* a tough transparent plastic that increases pole life—protects against warping and splintering.

*Trade Name

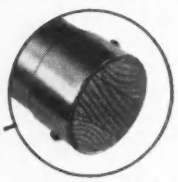


LAMINATED



Poles are of laminated construction, with wood grains carefully glued at cross angles for greater rigidity and warp resistance.

STEEL BUTT RING



Every Chance Pike Pole is reinforced at the butt end with a heavy steel ring . . . guards against chipping and splintering.

ABC INDUSTRIES

TWO SIZES . . . Chance Pike Poles are available in 2" and 2¼" diameter sizes . . . in a variety of lengths.

CT58-11

A. B. CHANCE CO.

GENERAL OFFICES: CENTRALIA, MO.

A. B. Chance Co. of Canada, Ltd., Toronto

2" x 2" for hard hats, identification, etc.

After applied the emblems look and feel like enamel. They will not peel, wrinkle, or flake off and will withstand fuel spillage and rough abuse. *Check NP* 540.

Exploring Coil Amplifier

THE MODEL TE Transistor Exploring Coil Amplifier is the latest development from Stewart Bros. Div. of Instrument Lab's. The Model TE replaces the previous Model E Amplifier.

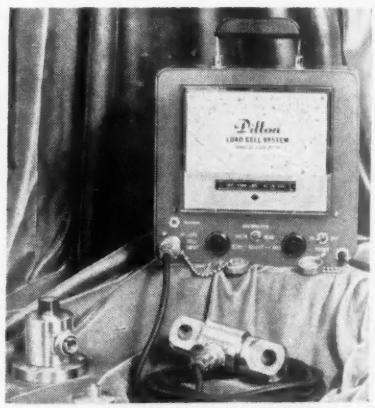
Unit is ¼ size and weight of previous Model E, has more signal gain, and uses four size Z penlight cells. Case is made of molded bakelite.

The coil and phone connections are made to two telephone jacks, one of which turns off battery when the plug is removed. In operation, it is only necessary to attach receiver plug to one jack on amplifier and exploring coil to other jack. Any type of receiver will give perfect results as long as it has an impedance between 40 and 100 ohms at reference level. *Check NP* 541.

Remote Load Cell System

W. C. DILLON & Co., Inc., has announced a new remote indicating load cell system that permits direct readings of forces, in pounds, at distances over 1000 feet from the actual cell. Applications are found wherever site proximity is inconvenient, dangerous, confined or outside of naked eye range, such as a scale dial located on a crane high off the floor or a setup on a rocket test stand, etc.

The load cell system utilizes a differential transformer principle. All tubes, amplifiers and expensive, troublesome circuitry have been eliminated by a special inverse-ratio circuit which carries sufficient voltage for integral magnification. The temperature compensated circuit utilizes semiconductors entirely. Separate reference charts, conversion tables and



circuit balancing are also completely eliminated.

As many as four load cells may be used with one indicator which totalizes individual loads. Typical applications for multiple cells are found on electronic platform scales and setups measuring structural stresses over extended areas. *Check NP* 542.

NEW PRODUCTS' DEPARTMENT 11-15-60
Telephone Engineer Publishing Corporation
7720 North Sheridan Road, Chicago 26, Illinois Date.....
ATTN: Dick Reynolds

Please send me additional information concerning the following New Products.

NP 534..... NP 535..... NP 536..... NP 537..... NP 538.....
NP 539..... NP 540..... NP 541..... NP 542.....

NAME..... POSITION.....
COMPANY.....
ADDRESS.....
CITY..... ZONE..... STATE.....

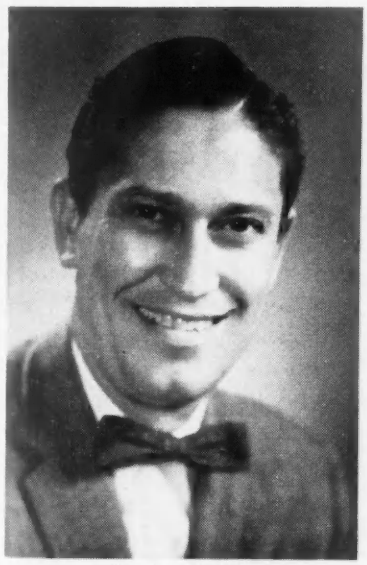
I am a subscriber to TE&M. ☐ Yes ☐ No (check one)

Berry & Co. Announces Management Changes

L. M. BERRY & Company recently announced three additional management appointments in its current realignment of management personnel. R. H. Eshelman was promoted

R. H. ESHELMAN

to general sales supervisor, R. T. Davis was appointed New York division manager, and H. Lamarche was named Pennsylvania division manager. The changes were announced



R. T. DAVIS

shortly after the appointments of John W. Berry as managing director, and J. W. Craig, Jr. as general sales manager.

Eshelman joined the company as an Ohio Division salesman in 1947. He was transferred to the Louisiana Division in 1948, and was appointed

Spiraflex® CORD

BY GENERAL INSULATED WIRE WORKS, INC.*

*Licensed to manufacture under existing patents

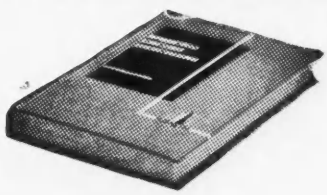
Telephone cord sets of proved performance backed by General Insulated's unmatched **experience** and know-how in the manufacture of quality telephone tinsel cordage:

***Spiraflex* HANDSET CORDS** in bright colors with non-staining thermoplastic jackets in **solid** color extrusions matching color shade and sheen of telephone sets. Also non-staining **black** Neoprene jacketed cords. Both types available with or without integral moldings and **terminations**. Furnished in standard or extra long lengths.

STRAIGHT HANDSET AND DESK SET CORDS are available in non-staining thermoplastic **constructions** in matching colors and in black Neoprene.

GENERAL INSULATED WIRE WORKS, INC.

A DIVISION OF GENERAL CABLE CORPORATION
Providence 5, Rhode Island



Save time and work in engineering design

Just Published! Here's a practical manual of tested product-engineering aids to help you get quicker, easier solutions to every day work problems. It offers a ready-made file of methods, formulas, tables, and charts for engineering top efficiency into devices, components, or complete products. Covers a full range of topics, from accessories and assemblies to clutches, control devices, electrical components, etc. Includes such modern developments as ultrasonics and automated assembly. *Over 1100 drawings show vital design details.*

PRODUCT ENGINEERING DESIGN MANUAL

Edited by Douglas C. Greenwood
Editor, Product Engineering Design Digest

342 pp., 8½ x 11, over 1100 illus., $9.

The book provides a storehouse of material to stimulate you to new design ingenuity, and to help you gain improved mechanisms, better assembly methods, and savings in materials and time. Over 100 topics are systematically arranged and illustrated. You can see how each device works, what it does, and how it meets design requirements. **Thus, the book gives you the "feel"** of a problem by showing in detail what is good, what has been done, and what is acceptable.

Gives up-to-date facts and data on resistors

Just Published! This book thoroughly covers fundamentals and needed data in the use of resistors in electronic design. You get groundwork in the basic aspects of resistance and descriptions of each type of resistor, the materials used in its manufacture, and characteristics associated with each type. Comprehensive tables give most manufacturers' data, with specific types of **resistors covered in common tables. Thus,** a design or components engineer can easily determine the scope of what is available. Full attention is given to such important areas as reliability in resistors, measurements, etc.

RESISTANCE AND RESISTORS

By Charles L. Wellard
Technical Director, Clifton Precision Products Co.

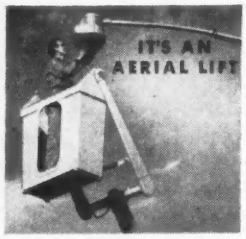
264 pp., 6 x 8, 82 illus., $8.50

Among the book's many special features you will find a detailed treatment of precision films as a replacement of wire wound resistors. Included, too, is information on the preparation of precision films by pyrolysis, evaporation, and reduction of oxides. Numerous charts and graphs present information that heretofore has seldom been readily available regarding the power and voltage ratings of resistors, the varieties of material used in their construction, and their many industrial applications.

Mail Your Order To:
Educational Division
TELEPHONE ENGINEER
PUBLISHING CORP.
7720 N. Sheridan Rd., Chicago 26, Ill.

UNIVERSAL TURRET DERRICK

3 IN ONE UTILITY TOOL



- 3 mounting positions—left rear, right rear, behind cab.
- Full 360° horizontal arc sweep.
- 8,000 lbs. max. cap. (2,000 lbs. min.)
- 30' sheave height—sets up to 65' poles.
- High tensile steel in box-type boom for greater strength.
- Diggers **stows** with main boom, **digs** with either section. Digs close (12½') or far out (21'): an 8½' horizontal range of action.
- Controls built into base (Optional mountings available).
- Available with optional fiberglass basket for use as aerial lift.
- Conveniently adapts to all standard line bodies.
- Power digger stows—unstows **automatically.**

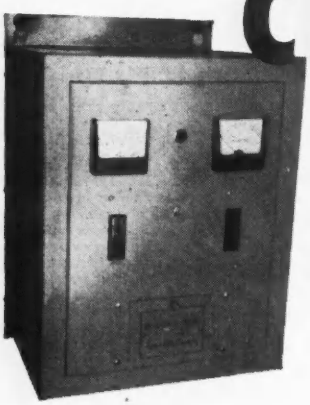
*Before you buy! Compare these remarkable features for range, power and versatility. Truco/Denver—the **complete** turret derrick.*

TRUCK EQUIPMENT COMPANY

3963 WALNUT STREET / DENVER 5, COLORADO

A NEW LINE OF *fully automatic* ACME MAGNISTROL

SILICON BATTERY CHARGERS



- NEWEST CIRCUITRY OF PROVEN DESIGN
- COMPLETELY STATIC MAGNETIC AMPLIFIER CIRCUITRY
- ±1% VOLTAGE REGULATION WITH ±10% LINE VARIATION
- FILTER COMPONENTS OPTIONAL FOR INAUDIBILITY ON TALKING CIRCUITS
- REMOVABLE CABINET SHELL; COMPLETE ACCESSIBILITY TO ALL CONTROLS

Standard Unit, Normally in Stock
1, 3, 6, 12 and 25 amperes; 24, 48 and 130 volt
Ask for Bulletin BC-324. Inquiries invited on units up to 300 amperes

CUSTOM EQUIPMENT DIVISION
ACME ELECTRIC CORPORATION
CUBA, NEW YORK
PLANTS IN CUBA, N.Y.—ALLEGANY, N. Y.

district manager of North Louisiana in 1951. In 1952, he was named district manager of South Louisiana, and was made New Orleans district manager in 1954. In 1954, he was promoted to Louisiana division manager and held that post until his recent appointment.

Davis joined the company as a salesman in Milwaukee in 1948, and carried out sales and supervisory assignments throughout the company until 1950, when he was appointed district manager in Tennessee. In 1954, he was named Pennsylvania division manager, and served in that capacity until his new appointment.

Lamarche joined the firm as a Pennsylvania division salesman in 1951. He became a supervisor in that

H. LAMARCHE

division in 1956, and was named directory supervisor in 1957. In 1959, he was appointed district sales manager in the Mid-Eastern Division, and held that position until his recent appointment.

K. J. Paul Joins Int'l Teletronics, Inc.

K. J. PAUL, formerly sales manager for the Telephone Division of Universal Controls Corp., has joined International Teletronics, Inc., Dallas, Texas, as vice president.

Paul will have the responsibility for directing sales promotion and application engineering for Teletronics' complete line of transmission equipment. He will also handle the techni-

K. J. PAUL

cal liaison between Teletronics and the manufacturers it represents.

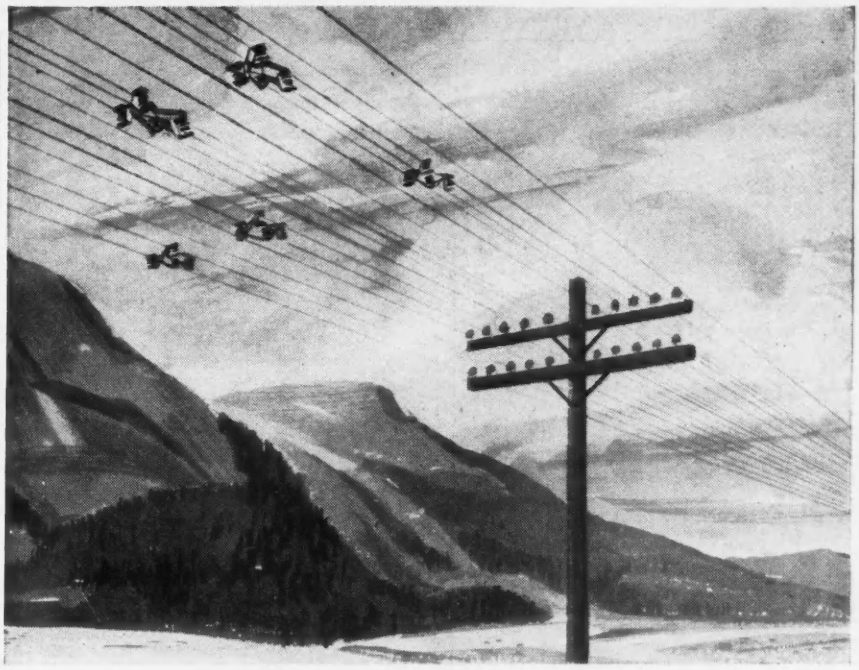
Following his graduation from Cass Tech in 1923, Paul joined Western Electric Co. in Detroit, Mich. He became associated with North Electric Co. in 1935. During the war, he taught all phases of MCX equipment engineering in Government schools at Galion. He moved to Dallas, Texas, in 1950 as North Electric's southwest regional manager.

GT&E Int'l Acquires Majority Interest in Italian Organization

GENERAL Telephone & Electronics International Inc., international subsidiary of General Telephone & Electronics Corp., has acquired a majority interest in the Radio Communications Division of Magnetti Marelli, Milan, Italy, according to an announcement by Donald C. Power, chairman and chief executive officer of GT&E.

Power said that a new company has been formed, known as Marelli Lenkurt, S.p.A., located in Milan. The new company will specialize in the manufacture of Marelli microwave radio and carrier apparatus, Lenkurt carrier and transmission equipment, and Automatic Electric S.A.T.A.P. (Milan) carrier and radio equipment, which division of the latter is being merged with Marelli Lenkurt.

In making the announcement, the GT&E chairman said: "This new company brings together in the international field three of the world's



MID-SPAN TRANSPOSITIONS...

easily, accurately and economically installed with Case aluminum span-point brackets

The Case span-point transposition bracket now makes it possible to transpose communication wires at any point of the line **between poles,** regardless of pole spacing ...eliminates the need for special transposition poles. This lightweight (only 3½ lbs. complete with insulators and bushings) non-corrosive, ruggedly designed bracket features insulators that roll thus protecting wire insulation in stringing and reducing installation time. It is the **only** bracket designed **especially** for mid-span transpositions.

All Case transposition brackets come equipped with a special rubber bushing... in the event of glass insulator breakage, the line wire falls on the rubber bushing, with no loss of communication service.

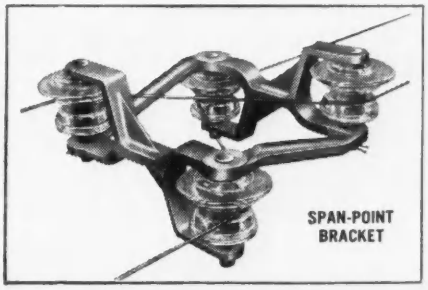
SOLD BY LEADING DISTRIBUTORS IN THE U. S.

CASE BRACKETS . . . STRONG, LONG-LASTING, ECONOMICAL, ESPECIALLY ADAPTED FOR CARRIER-CIRCUIT CONSTRUCTION

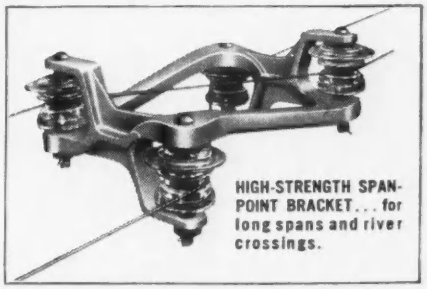
Write today for free illustrated brochure.

TRANSANDEAN ASSOCIATES, INC.

304 MAIN STREET, ORANGE, NEW JERSEY



SPAN-POINT BRACKET



HIGH-STRENGTH SPAN-POINT BRACKET... for long spans and river crossings.

BUDELMAN bec

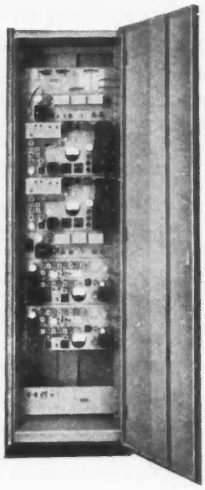
MICROWAVE

BUDELMAN POINT-TO-POINT RADIO SYSTEMS for the

- 2000 MC band
- 960 MC band
- 450 MC band

With capacity up to 30 voice circuits.

Write today for technical data.



BUDELMAN

ELECTRONICS CORPORATION

375 FAIRFIELD AVE. STAMFORD, CONN.

DISTRIBUTED BY: Buckeye Telephone & Supply Co., 1250 Kinnear Rd., Columbus 21, Ohio. Empire Telectronics, 5708 Balsam St., Arvada, Colo. The Engineering Service, Box 178, Butte, Mont. J. W. Flint, 325 Virginia, Ponca City, Okla. Nelson Electric Supply Co., 1123 Slocum St., Dallas 7, Texas. Somerset Telephone & Supply, North Anson, Me. SpaceCom, Inc., 2331 4th St., Santa Rosa, Calif. Tele-Radio Systems, Ltd., 3633 Dundas St., W., Toronto 9, Ont. EXPORT: Westrex Corp., 540 W. 58th St., New York 19, N. Y.

Thornhill Publishing Company

A Division of
Western Utilities Corporation

TELEPHONE
DIRECTORY
PUBLISHING

Selling — Printing — Engraving
Production — Distribution — Collecting
Counsel for Advertisers

OFFICES:

300 Montgomery Street, San Francisco 4, Calif.
2911 Bond Street, Everett, Washington
121 S.W. First Street, Beaverton, Oregon
116 South Rusk Street, Kilgore, Texas
130 East Lime Avenue, Monrovia, California

Call any of our offices
for a free estimate on your directory
potential *today*—no obligation!

leading manufacturers of radio transmission equipment. The teaming together of these enterprises will make possible a broad expansion of production in each country."

Pointing out that American investment abroad is increasing steadily, Power commented: "The growth possibilities in communications and electronics are particularly promising. These two fields have the greatest potentials of any major industries because they will provide the indispensable tools for large-scale economic growth and development."

The Marelli division at Sesto San Giovanni, Italy, is a major producer of microwave radio and radar equipment. Lenkurt Electric Co., Inc., a subsidiary of General Telephone & Electronics Corp., is a leading producer of carrier and microwave radio equipment. Automatic Electric International, a subsidiary of General Telephone & Electronics Corp., manufactures telephone and communications equipment in Canada, Belgium, and Italy.

Robert Deal Named General Sales Mgr. at Kearney

THE JAMES R. Kearney Corporation has announced the appointment of Robert E. Deal as general sales manager. Deal was formerly manager of marketing with the 3E Company, which has recently been acquired by Kearney. In his new position, Deal will be responsible for co-ordinating sales of the 3E line of switchgear and apparatus and the more diversified Kearney line of electrical utility equipment.

Ralph Chambers Dies

RALPH F. CHAMBERS, executive vice president of Gladwin Plastics, Inc., Atlanta, Ga., died of a heart attack on October 19, 1960, the day he returned from attending the recent USITA convention.

Mr. Chambers originally started in the plastic business with his own company in New Orleans, La., approximately 15 years ago. He joined Gladwin Plastics as sales manager in 1950. He was elected executive vice president of Gladwin in 1955 and continued in that capacity until his death.

Mr. Chambers was instrumental in the design and development of a number of items now in use in the telephone industry, including the Gladwin Boothette, Shelf-ette and different styles of carrying cases. He applied for a number of patents on various items that he developed during the last few years, and many applications are in process at the present time.

Mr. Chambers is survived by his widow and two daughters, his parents, a sister and three brothers.

Dial School Graduate Describes Unusual Pay-Plan at 1st Exchange

"SHE TOOK traffic count on her fingers." That's how Ralph Crass,

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, JULY 2, 1946 AND JUNE 11, 1960 (74 STAT. 308) SHOWING OWERNSHIP, MANAGEMENT, AND CIRCULATION OF —
Telephone Engineer & Management published 1st and 15th of each month at Rochelle, Illinois for October 1, 1960.

1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Roy F. Smith, 7720 N. Sheridan Rd., Chicago 26, Ill. Editor, John G. Reynolds, 7720 N. Sheridan Rd., Chicago 26, Ill. Managing editor, John G. Reynolds, 7720 N. Sheridan Rd., Chicago 26, Ill. Business manager, Don C. Sorensen, 7720 N. Sheridan Rd., Chicago 26, Ill.

2. The owners are (If owned by a corporation, the name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.) — Telephone Engineer Publishing Corporation, 7720 N. Sheridan Rd., Chicago 26, Ill. Roy F. Smith, 7720 N. Sheridan Rd., Chicago 26, Ill. Elizabeth E. Smith, 3205 Ocean Drive, Vero Beach, Fla.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) Roy F. Smith, 7720 N. Sheridan Rd., Chicago 26, Ill. Elizabeth E. Smith, 3205 Ocean Drive, Vero Beach, Fla.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required by the act of June 11, 1960 to be included in all statements regardless of frequency of issue.) 9159.

Roy F. Smith
Sworn to and subscribed before me this 1st day of October, 1960.
Richard A. Reynolds
(My commission expires Feb. 12, 1962.)

RALPH CRASS, right, owner of the Conway-Niangua (Mo.) Telephone Co., receives diploma and congratulations from A. R. ASCHETTINO, instructor-in-charge of Stromberg-Carlson's XY Dial School at dinner held for 50th class. JOHN H. VOSS, Telecommunication Division vice-president and general manager, and T. C. THOMPSON, far left, manager-commercial sales for the division, look on.

owner of the Conway-Niangua Telephone Co., Marshfield, Mo., described the size of his first exchange. Mrs. Crass served as operator.

"Traffic was so low, we couldn't pay her a wage," he continued. "She got five cents per completed call, plus a non-cash bonus . . . plenty of leisure time."

That was the way things were at the 10-line Myrtle, Mo., exchange in 1938. Five years later this same office served 200 stations.

By 1950, Ralph Crass had added the Conway and Niangua offices to his holdings. Crass applied for and received a Stromberg-Carlson Credit Corp. loan in 1956. Niangua was converted in 1957, and last February, the Conway office also began XY Dial service.

To gain a better knowledge of his equipment, Crass enrolled in the latest class of Stromberg-Carlson's XY Dial school at Rochester, N. Y. The class, 50th in the school's history, brought together 43 representatives from Independent telephone companies, government installations, and Stromberg-Carlson's engineering and installation departments.

Started in 1951, the school has trained 1,432 telephone men (and women) in modern dial techniques. Students from all across the United States, plus several foreign countries, have taken advantage of the comprehensive instruction offered as a service to customers.

Class members were awarded certificates signifying completion of the course at a 50th anniversary dinner. Top management officials of Stromberg-Carlson's Telecommunication Division were on hand to congratulate the graduates on their achievement.

Cook Electric Acquires NRK Mfg. & Engrg. Co.

AT A special meeting last month, Cook Electric Company stockholders voted to approve the acquisition by Cook of N.R.K. Mfg. & Engineering Co., a 17-year-old Chicago firm, through the merger of NRK into Cook. NRK stockholders had previously approved the merger. In the year ending June 30th, Cook's sales were $12,917,000.

During the next few months, NRK operations will be transferred to a new 12,000 square foot building in the Cook Technological Center, Morton Grove, Illinois. At the center, the facilities of Cook Research Laboratories will be available for continuing the NRK business of furnishing the microwave industry a complete range of services covering the design and manufacture of microwave components.

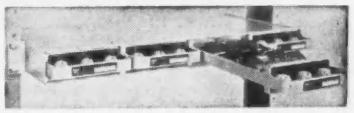
BUDELMAN bec

TYPE 251A

VOICE FREQUENCY REPEATER

A new exciting development from Budelman. Four of these new transistorized repeaters fit on a mounting shelf in only 1¾ inches of rack space.

(PATENT PENDING)



Up to 20 db gain in both directions. Battery drain from 12, 24 or 48 volt battery is only 3.4 milliamps. Low price, high reliability. Send for data sheets today.

BUDELMAN

ELECTRONICS CORPORATION

375 FAIRFIELD AVE. STAMFORD, CONN.

DISTRIBUTED BY: Buckeye Telephone & Supply Co. 1250 Kinnear Rd., Columbus 21, Ohio. Empire Telectronics, 5708 Balsam St., Arvada, Colo. The Engineering Service, Box 178, Butte, Mont. J. W. Flint, 325 Virginia, Ponca City, Okla. Nelson Electric Supply Co., 1123 Slocum St., Dallas 7, Texas. Somerset Telephone & Supply, North Anson, Me. SpaceCom, Inc., 2331 4th St., Santa Rosa, Calif. Tele-Radio Systems, Ltd., 3633 Dundas St., W., Toronto 9, Ont. EXPORT: Westrex Corp., 540 W. 58th St., New York 19, N. Y.

HOW TO SAVE MAN HOURS IN BRUSH DISPOSAL

This 20-page free book shows how to cut brush disposal costs up to 50%. Filled with facts, it has photos of Fitchburg Chippers in action, names of users, different models to solve specific problems.

Mail coupon for your copy today!

FITCHBURG ENGINEERING CORPORATION

Fitchburg, Mass., Dept. TEM-611

Name_____

Company_____

Address_____

City_____ State_____

TELEPHONE MARKET PLACE

HELP WANTED

CABLE SPLICERS Station Installer, Equipment Installers, Linemen. Experienced men needed. Steady work, good pay. Henkels & McCoy, 1800 Johnson Street, Elkhart, Indiana, or 6100 N. 20th St., Philadelphia, Pa.

AMBITIOUS MEN — Qualified as station installers, equipment installers, cable splicers, linemen. Work in midwest. Harris McBurney Co., Inc., P. O. Box 267, Jackson, Michigan.

TELEPHONE COMPANY DIVISION ENGINEER needed immediately. Engineering experience should include outside plant, special services and PBX & PABX. This position is with a large Florida Independent Telephone Company. Salary commensurate with experience and qualifications. Please send detailed resume and photo to Box 137, Telephone Engineer. All replies strictly confidential.

FOR SALE

PARTS FOR 302 W. E. TELEPHONES, guaranteed, clean, complete, operational. All prices lots of 50 or more. P-29500 Switch-hook spring assembly 20¢ each. F1 Transmitter 35¢ each. HA1 Receiver 50¢ each. 195-A Condenser 25¢ each. F1AW-3 Handsets $1.25 each. 101-A Induction Coil 35¢ each. Kellogg 20 and 30 cy. and W.E. straight line ringers 75¢ each. 5H Dials $1.50 each. Write — M. R. Anderson, 2511 W. Jean St., Tampa, Fla. Phone RE 7-2998.

NORTH 60 LINE BOARD — 60 Line Equipped also Automatic Electric Board 50 Lines. Both priced for quick sale. For additional information, write Dixie Telephone Company, Claxton, Georgia.

MAGNETO TELEPHONES — Leich 901 wall or desk magneto telephones. Cleaned, tested and guaranteed, $16.50 each. As removed from service $15.00 each. Turtle Lake Tel. Co., Turtle Lake, Wisc.

ONE NORTH McBERTY MCX 500 selector type dial switchboard, equipped with 250 lines. Now crated, ready for pick up — $3,500.00. One North all relay MCX 200 (broadspan) switchboard, charger, batteries, main frame, and powerboard. Equipped 100 lines, 200 line capacity. Now crated and ready to pick up — $2,000.00. Used dial telephones: 370 Western Electric 302-D; 78 North 9800; 29 North 9000; 164 Leich 615; 142 Stromberg Carlson 1243; 150 Stromberg Carlson 1250. Priced at $5.00 each. $4.50 in quantity lots of 50 or more. Polar Rural Telephone Corp., Park River, N. Dak. Phone BUtler 4-7221.

WANTED TO BUY

INDIVIDUAL interested in purchasing any small telephone company. Write Box 155, c/o TE&M.

TELEPHONES — Any condition. Desk stands, wall sets, etc. Advise quantity available. Write Box 78, c/o TE&M.

FIELD ENGINEERS

TELEPHONE INSIDE PLANT ENGINEERS

Minimum 8 years experience necessary with BSEE degree preferred. General inside plant engineering background to include teletype systems experience.

TELEPHONE OUTSIDE PLANT ENGINEERS

Minimum 8 years experience necessary with BSEE degree preferred. General background in outside plant engineering to include experience in the latest telephone cable gas pressurization techniques.

These assignments and subsequent services will be at Mid-Western Air Force Bases. Submit a complete resume including minimum salary requirements in confidence to:

MR. H. J. RECKAS, Personnel Mgr.

Advanced Communications Engineering

A Division Of
Cook Electric Company
Chicago, Illinois

6038 Twenty Eighth Ave., S. E.
Washington 23, D. C.

FOR SALE

Parts for Kellogg #1000. Cleaned and tested

Sub bases with chrome plungers	1.50 ea.
Handset handles	1.00 ea.
Induction Coils	1.00 ea.
Condensers	1.00 ea.
Ringers (most frequencies)	1.50 ea.
Transmitters	.50 ea.
Handset rings	.15 ea.
Handset transmitter cups	.25 ea.
Handset receiver caps	.25 ea.
Receivers	.50 ea.
Kellogg dials As removed	
Numbers only	1.00 ea.
Numbers and letters	1.25 ea.
Kellogg 1100 wall and 1000 desk As removed from service No broken	7.00 ea.

Parts for A. E. 40 Cleaned and tested

Cases	2.50 ea.
Handles only	1.00 ea.
Transmitter and receiver units	.50 ea.
Caps	.25 ea.
Complete handles	2.00 ea.
S. L. Ringers	.50 ea.
Condensers Large	.35 ea.
Condensers Small	.25 ea.
Rubber Base Rings (New)	.20 ea.
A. E. Dials As removed	
Numbers only	1.00 ea.
Numbers and letters	1.25 ea.

FREE

Instructions on changing cases in 5 minutes. No soldering.

Telephone Equipment, Inc.
Montrose, Michigan

WESTERN ELECTRIC PBX SWITCHBOARDS

W. E. #551-A PBX Switchboards, 30 to 40 lines, 5 to 10 trunks, 10 cord circuits. (As removed from service or Reconditioned)

W. E. Type 52 Operators Sets (New)

Battery Eliminators and Subcycles (Recond.)

BUCKEYE TELEPHONE & SUPPLY CO.

1250 KINNEAR RD. COLUMBUS 21, OHIO

HUDSON 8-0655

WANTED TO BUY

WANTED — All makes, old telephones. Our truck will pick up and pay you cash on the spot. Telephone Co., Turtle Lake, Wisconsin.

45A LENKURT TERMINAL east or west DC operated, equipped six or more channels. Pecos Telephone Co., Pecos, New Mexico.

BUY OR MERGE — Well-established telephone equip. manufacturer with international distribution desires to purchase or merge smaller company with good potential but limited sales. Write Box 134, c/o TE&M.

BELTS-CLIMBERS

BELTS — CLIMBERS — Complete Lineman's equipment, W. M. Bashlin Co., Bashlin Bldg., Grove City 1, Pa.

BOOTHS

BOOTHS — Telephone — Outdoor — Indoor — Steel — Stainless Steel — Sherron Metallic Corp., 1201 Flushing Ave., Brooklyn 37, N. Y.

CORDS

CORDS, Switchboard (with or without plugs), Instrument (straight and retractile cords in eleven colors. — Commercial Cord Co., Inc., 26 Main St., Clifton Springs, New York.

CONSTRUCTION EQUIPMENT

BORING MACHINES, EARTH — High way Trailer Co., Edgerton, Wisc.

EVERY MONTH

More and More Telephone Companies use DIRECTORIES produced by

Your Inquiry Respectfully Solicited

LELAND MAST DIRECTORY COMPANY

1619 GREENWOOD WILMETTE, ILL.

CHRISTMAS MATCHES

PERSONALIZED MATCHES FOR CHRISTMAS. 25 books with initials you select embossed in gold $1.50 postpaid. Three initials. No. c.o.d's. Brewster House, Box TE203, Dearborn, Michigan.

DECALS

DECALS

Made for trucks and equipment

Small or large quantities

Write for free catalog.

MATHEWS COMPANY

827 S. Harvey Oak Park, Ill

DIAL REBUILDING

DIALS, Rebuilt

Telephone Repair & Supply Co.

1760 W. Lunt Avenue, Chicago 26, Ill.

"DIALS"

Dial Haven Reconditioning Service provides expert workmanship plus genuine and improved parts to insure longer life for your telephone dials.

DIAL HAVEN INC.

P.O. Box 655 Monroe, N.Y.
Code 914 783-2221

POLES

POLES. Southern Yellow Pine — Taylor Colquitt Company, 217 Main St., Spartanburg, S. C.

POLES, Southern Yellow Pine Pressure Creosote and Creo-Penta — Piedmont Wood Preserving Co., P. O. Box 700, Augusta, Georgia, Spartanburg, S. C.

POLES, Southern Yellow Pine — Texas Creosoting Co., Orange, Texas.

CARRIER, 3-Channel + VF

W.E. CFIA (Sig. Corps)
Repeaters, for use with CFIa
CF3A, new
W.E. C-Carrier Terminals
C.Carrier Repeaters
Filters — CAO Types

TEST BOARD EQUIPMENT

Patch cords & plugs
Jacks & Mountings
Relay Racks
Bridges—L&N
Transmission Measuring Sets
Portable line Test sets

MDF PROTECTORS Complete

W.E. #1435 W, 20 pr. $10 new
1268 A, 20 pr. 10 new
1269 A, 20 pf. 10 new
Cook #100 .....15 new
A.E. #675, 20 pr..... 10 new
22 pr..... 12 new
MDF VERTICALS, W.E. & Cook cable rack & fittings, Ladders

W.E. Interior Terminals & Chambers protected & unprotected types
Raytheon Rectichargers - Rectifilters
24 Volt — 48 Volt

SWITCHBOARD PARTS (all mfg.) New & Good Used

Jack & Lamp Strips
Line & cut-off relays, trunk, etc.
Cord & plugs, lamps & caps
Lamps:
W.E. A-1, 24 volt, new .....$16 C
G.E. 24B, 24 volt, new ..... 16 C
G.E. 18B, 18 volt, new ..... 16 C
many others (same price)

Shipped On Approval
Satisfaction Guaranteed
Huge savings on everything in our multi-million dollar stock.
Let us quote on your other needs

SWITCHBOARDS, manual

W.E. #12 (universal) new (also BD110)
W.E. #605 PBX new, 2 position #550B, rebuilt — 80 Line
W. E. #551A rebuilt 20 to 60 line
W.E. #506 PBX (cordless) 7 to 12 line, rebuilt
W.E. 507B Rebuilt — $450.
Kellogg CB (universal) 1600 type Per spec. #38008 (post war)
12 positions available
16 cord circuits (univ. per #4501-1, 5)
SL, 2 or 4 or 10 party ringing
#258 jacks and #25 lamp jacks wired to multiple cables (little wear)
Line & cut-off relays wired to term. on relay racks — also trunk & mag equip. power board, etc. (priced to move now)
Kellogg PBX K-100 (100 line) new & Rebuilt
Kellogg PBX (Cordless) #1007 CCX
5x12, brand new $150
Like New $100
5x20 — 2007-11, Like New $150
Kellogg 200 line CB-LB Central Office, used 1 year (like new) $800
Kellogg Fire reporting 40 & 100 Line
Kellogg Magneto Cordless 24 Volt-Lamp Signals, 20 Line New $150
12 Line New $100
Note: Lines convertible to CB with kick coils (C-111 $1.00 each)
Stromberg-Carlson #106 PBX (80 line) like new $400

Telectric Co.

1218 VENICE BOULEVARD (DDD 213) Richmond 8-2249 LOS ANGELES 6, CALIF.

POLES

POLES • CROSSARMS
RAIL or TRUCK DELIVERY
Pressure-treated to your specifications. 16 sales offices, 34 plants serving you. See Yellow Pages, write or call Pittsburgh EXpress 1-3300.
C-10
KOPPERS COMPANY, INC.
Wood Preserving Division
777 Koppers Bldg., Pittsburg 19, Pa.

PROTECTIVE EQUIP.

PROTECTIVE EQUIPMENT — Reliable Electric Company, 11333 Addison St., Franklin Park, Ill.

MORT CLARK'S **GALV-WELD** ALLOY ORIGINAL & GENUINE
Corrosion means costly service calls. Use more galvanized field equipment with Galv-Welded joints for towers, boxes, etc. Write for details.
GALV-WELD PRODUCTS
Dept. TEM P. O. Box 1087
Holmes Beach, Florida

SOLDERING IRONS

CARTRIDGE-HEATED SOLDERING IRON

Indispensible for all line work where no power is available. The perfect tool for the purpose, perfected and used for years by a major telephone company. Iron uses any one of 4 interchangeable tips, from ¼-inch to 1-inch, pyramid or chisel. Heat unit is expendable, thermit cartridge.

Send For Descriptive Circular
KEMODE MFG. CO., INC.
151 W. 18th St., N.Y. 11, N.Y.

UNIVERSAL FITTING

UNIVERSAL FITTING with **FLEXIDUCT**
Part No. 345

Solves All Over-the-Floor Duct and Fitting Problems

Use as tee, riser, ell, 4-way, under-floor input, terminal box, junction box or in combinations. Other tees, ells and risers available.
WINDERS & GEIST, INC.
2219 No. Cotner Blvd. Lincoln 5, Nebraska

THE FIELD A SMALL AD COVERS

PROFESSIONAL SERVICES

ALLEN K. HAMILTON ASSOCIATES, INC.
CONSULTANTS • SYSTEMS ENGINEERS
GENERAL ENGINEERS
WOODSTOCK, ILLINOIS TELEPHONE FEderal 8-2400

PROFESSIONAL ENGINEERING AND CONSTRUCTION SERVICES
Plant Construction Crews • Installer Repairmen Cable Splicers
CENTRAL OFFICE INSTALLATION
Complete central office routines, tests & adjustments, carrier installations, tests & alignments, key system installations
HENKELS & McCOY
PHILADELPHIA
1800 Johnson St. Elkhart, Ind. COngress 4-1121
Atlanta, Ga. TR 5-2769 — St. Johns, Mich. CA 4-4175
Ashland, Ohio 3-7543 — St. James, Minn. 492
Bloomington, Ill. 5-7717 — Durham, N.C. 7-1316
Lebanon, Ky. 660 — Wausau, Wis. 2-2356
Victorville, Calif. 5-9012
PERFORMANCE Has Built Our Business

TUDOR AND YAGER INC.
TELEPHONE CONSTRUCTION
TIPTON, INDIANA
Phone OSborne 5-2267

McGRATH ENGINEERING, INC.
Consulting Engineers
209 West 6th Street
TOPEKA, KANSAS
Telephone CEntral 2-2358

CARL C. CRANE, INC.
Consulting Engineers
121 S. Pickney Street, Madison 1, Wisc.
Telephone ALpine 6-0247

MURPHY ELECTRONIC RESEARCH DEVELOPMENT MANUFACTURE
ENGINEERING LABORATORIES, Inc.
4419 TULSA
HOUSTON 24, TEXAS
Write For FREE Literature

Davis Construction Co.
UTILITY PLANT CONSTRUCTION
45 North Clark Street • Sullivan, Missouri

PROFESSIONAL SERVICES

SLOAN, COOK & LOWE
CONSULTING ENGINEERS
SUITE 1344 120 South La Salle Street
CHICAGO
Appraisals—Original Cost Studies
Investigations
Depreciation, Financial, and Other

Communication Systems, Electric Transmission and Distribution Systems
ASSOCIATED ENGINEERS, INC.
CONSULTING ENGINEERS
1127 Alderson Ave.
Billings, Montana
TEL. 2-4113

INSPECTION SERVICE
"AT TIMBER TREATING PLANTS"
Of poles, crossarms, and preservative treatments. Analysis of wood preservatives
Consultation and specification writing
A. W. WILLIAMS INSPECTION CO., INC.
MOBILE, ALABAMA
New York St. Louis Portland
Inspectors stationed throughout the U.S.A.

C. D. EHINGER, P. E.
Consulting Engineer
Telephone Utilities
Mail Address:
639W. Madison
Decatur, Indiana

TELEPHONE EQUIPMENT

Whether a Winch Line Hook or a complete Line Body check your requirements with

UTILITY TOOL & BODY CO.
CLINTONVILLE, WISCONSIN
UT&BCo

Order Your Personal Copies of TE&M Today!
1 Year - 24 Big Issues - $4.00

Transmitter

PUBLISHED BY STROMBERG-CARLSON
A DIVISION OF GENERAL DYNAMICS

S-C STROMBERG-CARLSON

News and views of Independent telephone people. VOLUME 9, NO. 8 • NOVEMBER, 1960

The Petite is ready for Christmas

Meet your subscribers' gift needs this Christmas

As Christmas 1960 approaches, two facts are clear: (1) subscribers are *excited right now* about the new, small, extension telephone with the illuminated dial; (2) the only instrument that is *available right now* to meet this unusual demand is the PETITE telephone by Stromberg-Carlson.

Only one Christmas a year

Independent companies recognize these facts. Those that have instruments to complete a sale when the subscriber is in a buying mood are enjoying high-profit extension sales considerably above forecasted levels. There's still a magic about Christmas time that converts weeks and months of indecision about the "right gift" into a sudden, undeniable desire that craves to be satisfied. The telephone company that can give a positive, "Yes, you can have your PETITE for Christmas," has the answer that not only makes a sale when the customer is eager to buy — it also makes your company a leader in your field.

Features and Rates

Subscribers take initial telephone service because it is a necessity; there is little or no selling involved here. But they buy *extra* service — extensions — because of features that make the additional cost worth while for them: saving time and steps, no lost calls, greater privacy, a feeling of security — especially at night. Small size and styling which conforms with the nationally advertised "Princess" are additional inducements. The subscriber will accept a somewhat larger monthly bill in terms of added convenience and service. But in general these benefits must be pointed out; this does involve selling the extension idea, for the telephone company must compete for discretionary dollars.

Are extension sales also worth while for the telephone company — in hard dollars? Rates for extension service using a standard-type instrument are a matter of record. It is generally agreed that these rates provide

"Results of my exhaustive tests clearly indicate that this instrument out-performs its own specifications.

"Besides," says young Mark Hanson to his father Wesley Hanson of Hanska, Minnesota, "I want one!"

Advertisement

Just enough — all in good taste. Live display of instruments in beautiful new commercial office is demonstrated by Mr. Charles Cashel of Worthington, Minn.

a high contribution to profit, with short write-off of investment funds.

How about rates for an extra-feature phone like the PETITE? Tariffs are already on file in almost all states, with approved premium charges over and above the normal extension charge. Let's compare the revenue-generating possibilities of the PETITE telephone, used as an extension, to a standard-type instrument:

1) *How long will it take to absorb the higher first cost of the PETITE?*
   At premium rates now in effect in most states, and suggested for pending applications, the difference will be made up in 8-9 months.

2) *At these same rates, how does the revenue compare with original purchase price of these instruments?*
   The PETITE telephone generates revenue equal to its cost *seven months sooner* than a standard-type instrument.

3) *How does the rate of return on dollars invested compare?*
   The rate of return on the PETITE is approximately one-third (32%) higher.

Thus, it can be seen that if ordinary extension service is profitable — and this is a fact that is beyond question — PETITE-type extension service will provide considerably higher profits. And since this higher return is granted because of extra features that subscribers want, everybody benefits.

Sales are made, not taken

Never before has there been such stimulated interest in a new telephone instrument. The Independent telephone company is the beneficiary of nationwide promotion that makes its

Joe Arnold of Spencerport, N. Y., and Randy Becker of Middleburg, N. Y., enter contest to guess number of parts in Petite telephone at a recent gathering of telephone managers in Rochester, New York.

part easier, but *does not* conclude a sale. Companies that have already topped their sales forecast have achieved this largely through their own efforts, building on and supplementing public interest already present.

They have found the Stromberg-Carlson Christmas Promotion Kit (free materials, including gift wrappings, counter cards, newspaper mat service and radio spots) very useful. They use displays of PETITE telephones to bring the subscriber and the instrument face to face. Where the illuminated dial feature is demonstrated, the display is most effective.

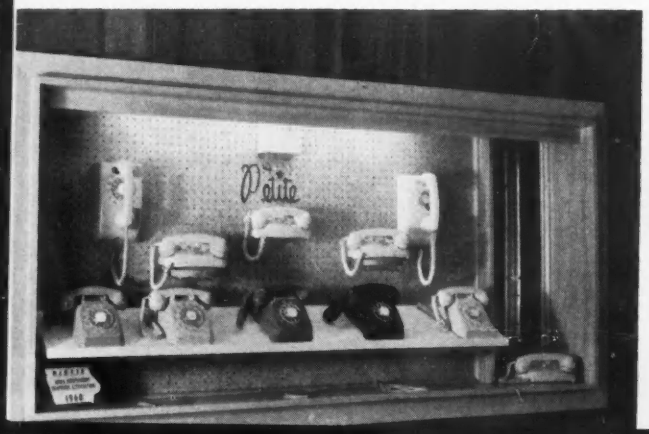
They have trained their commercial employees in the answers to such questions as tariff, deferred billing, charges to another party in the case of Christmas gifts, installation deadlines. The manager keeps a check on inventory so as to avoid disappointment with a Christmas delivery.

What about the Joneses?

Many of these Christmas gift sales will be the direct result of pre-holiday installations . . . for someone who saw a PETITE telephone in another person's home or place of business.

Some managers have selected for personal contact certain homes where groups are known to gather. An installation there will develop as much interest as an instrument on the commercial office counter. Others have seen sales materialize because of an installation in some semi-public place such as a beauty parlor, a doctor's waiting room, or a private club.

One manager, who has had better than average success in selling PETITE service, made it clear that these sales bore no relationship to economic status or even to the grade of service of the main station. There are different reasons for success in each Independent community, but on one point there is agreement: nothing sells the PETITE like a PETITE in use.



One of the finest permanent displays of telephones was planned by Filmore Melick as a principal part of decorative scheme in the office of the West Liberty (Iowa) Tele. Co.

Canada, too, is excited about the new, small telephone, featured prominently in a recent Counties convention.

Although 4000 miles apart,

sunny Texas and snowy Alaska towns enjoy same dial service

Con Miller, mayor of North Pole, places first call over XY Dial system to Anchorage, Alaska.

Climate, clothing and careers are just some of the differences you'd spot right away in Brazoria, Texas, and North Pole, Alaska. And if you stayed in either town very long, you'd note one thing they had in common — the finest in dial telephone service.

Brazoria is located near Houston, Texas, a long 4000 miles southeast of North Pole. Mr. and Mrs. Charles Hendrix own the Brazoria Telephone Company.

The company recently moved into a new headquarters building and at the same time extended its XY® Dial service to Freeport and Lake Jackson, Texas. More than 1300 Southeast Texas subscribers are served by the company.

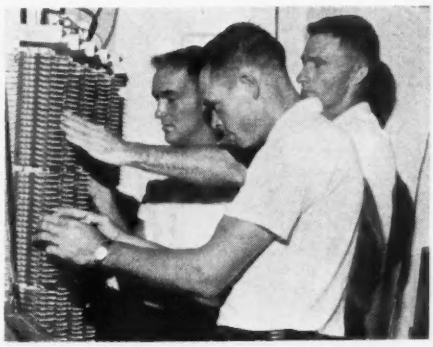
A display of old and new telephones and a cable splicing demonstration were features at an open house held in the new building.

Brazoria Tel had 130 subscribers when purchased by Mr. and Mrs. Hendrix in 1947. The greatest period of growth has come in the past seven years when the station count jumped 160%.

Farther north, the Trans-Alaska Telephone Company has started on its program to bring modern dial service to a large part of the 49th state. The company, which is based in Anchorage, plans to convert 15 Alaskan exchanges to XY Dial, using Stromberg-Carlson's new COMPAK-I.

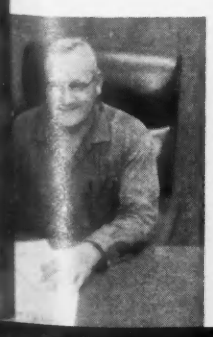
Trans-Alaska was founded by president John E. Field, a little more than a year ago, but has already shown a spirited growth. At North Pole alone, it is expected that a total of 400 subscribers will be served.

Brazoria mayor, J. O. Fossel, Jr., took an active part in open house ceremonies of Brazoria Telephone Co.



Glen Reynolds, Eddie Svatek and Nick Phillips, all of Brazoria Tel., kept busy opening lines on old main frame.

James Ditto, Trans-Alaska Tel. vice president and general manager, third from left, played host to interested guests at cut-over. From the left, Major Le Blanc, Eielson AFB, Alaska; Warrant Officer Baggs, Eielson Base Communications Officer; Mr. Ditto; and Harry Riemer, Telephone Department superintendent, Fairbanks.

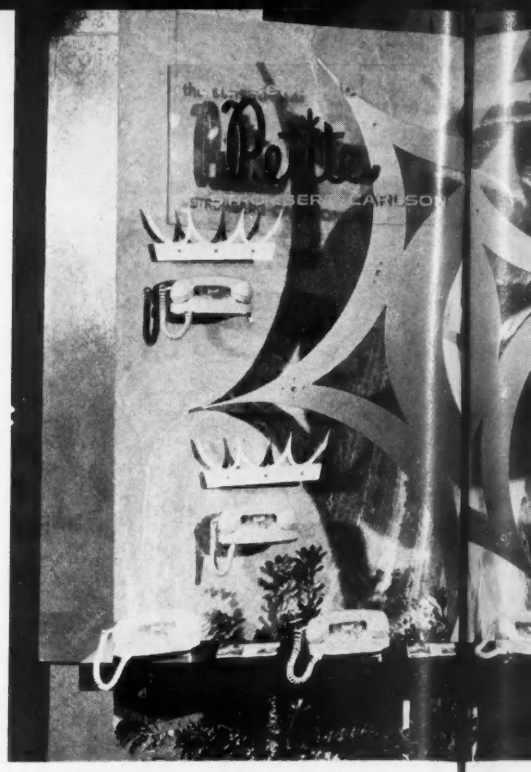


Left — Mr. and Mrs. Charles Hendrix, owners of the Brazoria Telephone Co., Brazoria, Texas.

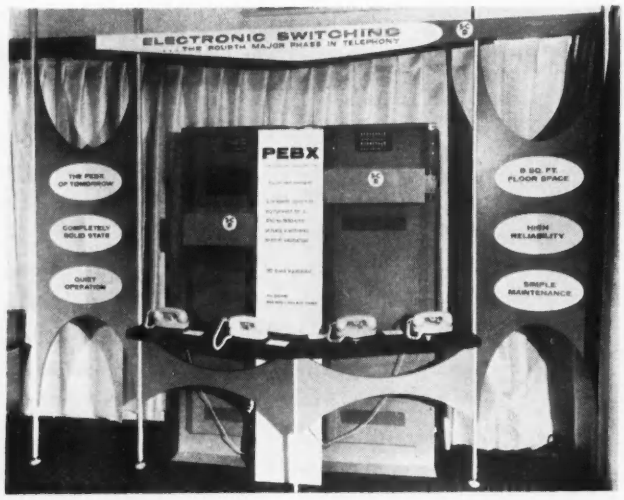
Right — John Field, president of Trans-Alaska Tel, discusses a feature of the XY Dial equipment with Ernie Larson, left, Stromberg-Carlson sales representative.

Follow the U.S.I.T.A. crowds—

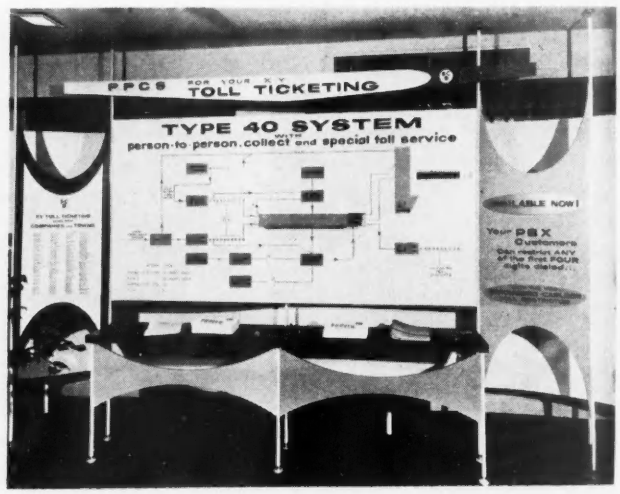
this is the path they took



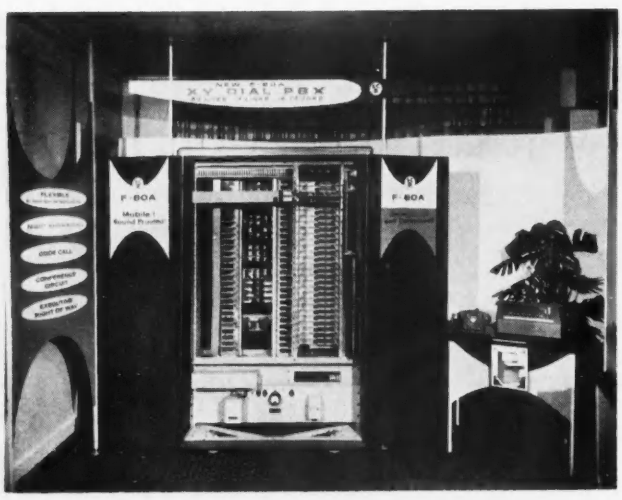
Colorful PETITE telephone display was center of attraction at U.S.I.T.A. convention. Crowds gathered here to see this smart new instrument now available to Independents. Then they proceeded to view other new Stromberg-Carlson developments, some of which are shown below.



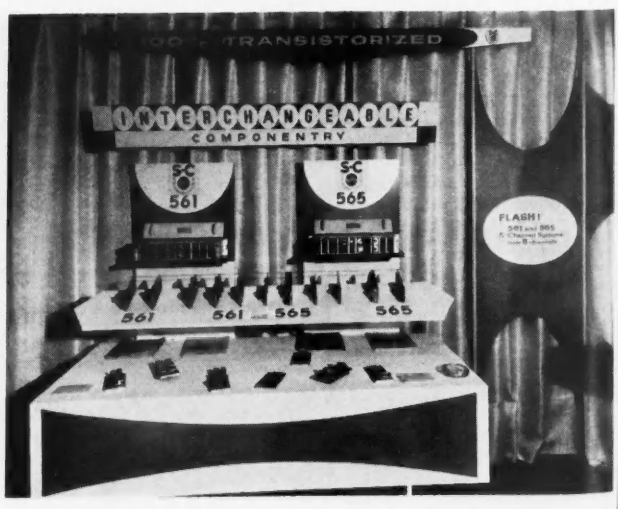
Electronic switching — PEBX — puts 500 lines in only 8 square feet of space.



Toll Ticketing — simple additions to Type #40 Systems give you P.P.C.S.



The F-80A Dial PBX provides compact unit in soundproof, mobile cabinet.



Carrier — new 8-channel systems have interchangeable componentry.

Advertisement

"What's new?" was a question that didn't have to be asked at last month's U.S.I.T.A. convention. Independents got the answers about all the latest developments in telephony — especially in the Stromberg-Carlson suite.

Sharing the spotlight with the PETITE phone was the new Private Electronic Branch Exchange (PEBX). This electronic PEBX prototype model is not yet available to the Independent industry. However, several telephone people have already expressed interest in receiving the first production model for commercial use.

Toll Ticketing, a proven revenue booster, came in for its share of attention, too. Among the visitors at this display were many already profiting from this concept of faster dial service. New developments, like P.P.C.S., now make this system even more profitable.

Eight-channel carrier, both subscriber and trunk, received favorable comment as did the new F-80A, the PBX system that provides 80 lines for modern office communications in 8 square feet of floor space. Other features at the convention included Stromberg-Carlson's message circuit dialing, 4-wire switching and the COMPAK-I.

There was a lot to see. If you couldn't make this one, don't miss next year's show.

Finished hula-hoop wreath is shimmering permanent decoration which will neither fade nor wilt. It can be used season after season.

For the ladies: hula-hoop wreaths

You can add a distinctive touch to your Christmas decorations with this attractive holiday wreath made from the kids' old hula hoop. All you need is the hoop, three short lengths of wire, and some red and green ribbon.

This inexpensive wreath will brighten your picture window, dress up a blank wall or add cheer to the outside of your house on wall or door.

The wreath is made by tying emerald-green bows made of shiny "Sasheen" ribbon to the hula hoop. Colorful red candles in the center of the wreath are made of smaller bows fastened to the wires which are tied across the hoop.

You can add an individual flavor to your wreath by placing pine cone clusters or artificial holly berries on it. The wreath can be stored and used year after year.

To make your Christmas wreath, just follow the pictures and easy instructions on this page.

1. To make the large green bows for the wreath, wrap about ten feet of ribbon around a piece of cardboard six inches long. Remove cardboard, notch bow in the middle and tie with a shorter length of ribbon as shown. To obtain the "shooting star" effect, one-half of each loop can be "feathered," cutting from the tie outward at a slight angle with a pair of scissors. Then pull out the individual loops and shape them.

2. Next, tie three lengths of thin wire across the hoop, and then tie the bows to the hoop itself. (About 30 bows are needed for this part of the wreath.)

3. Next, tie a series of small red bows to the three wires to form each of the candles. The red bows are made by using a smaller length of cardboard to wrap the hank and shorter lengths of ribbon. Candle flames are made from a piece of yellow and a piece of red ribbon cut in the shape of a flame and fastened to the wire above the candle with cellophane.

Independents serve much of our choicest vacationland. One such place is the Mille Lacs Lake region in central Minnesota. Telephone service is being extended and improved by Dell Ludenia (above right). With Dell and Ethel Ludenia is Harvey Knudsen, auditor for several Minnesota Independents.

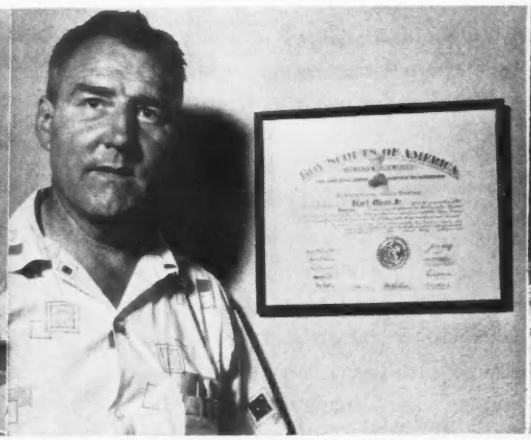
Personally yours:

The focus of the editor's camera continues to be on people, who are the lifeblood of Independent telephony.

The interesting assignment of your editor has been to visit with these people in their towns —to learn at first hand how they are meeting situations that are always just a little different. In these calls one characteristic of Independents that distinguishes them from employees in other systems is increasingly clear: they are *citizens* first. This is because their roots are usually deeper, their own futures tied so closely to the communities where they live and work.

Through photo and caption you will continue to meet this cross-section of our industry — leaders and workers in and for their community — whose specialty is to provide the finest in telecommunications.

Informal flashes at F-16



Editor meets editor at Fairmont, Minnesota, divisional headquarters of Central Telephone Company. The "then" Miss Helen Hunt works on company publication in addition to full-time job as secretary to Mr. A. E. Lindekugel, divisional manager . . . Karl Mess of Phillips, Wisconsin, has contributed many years to the Boy Scout movement. His Silver Beaver award is one of the highest forms of recognition for service to youth. President Ernest Larson and manager J. L. "Bud" Greene huddle on b plans for Chisago City (Minn.) Telephone Company. Influx from Cities is provided for by superior plant and five XY Dial exchange growing towns of the area.

Forty-one years of service for Miss Maybelle McMillan, former operator, chief operator and now cashier at Boscobel, Wisconsin. This company, operated by the North-West Telephone Company, has an outstandingly beautiful building — first of several planned in a large-scale conversion program now in progress for the several towns in this system.

Skilled hands — Installer Clyde er of Central Scott Telephone Eldridge, Iowa.

Breakfast with Mr. and Mrs. Albert Spry of Howard City, Michigan. President of the Community Telephone Company serving all or part of six townships in the Muskegon River valley, Al Spry first learned about Independents as salesman for storage batteries. He is also president of the local Economic Development Commission.

Transmitter
GEORGE B. FORBES, Editor
J. T. LONG, Associate

Published by the Telecommunication Div
STROMBERG-CARLSON
A DIVISION OF GENERAL DYNA
Rochester 3, New York

is a registered trademark of Strombe

ADVERTISERS' INDEX

AC — The Electronics Div. of General Motors Corp. ..... **Inside Back Cover**
Acme Electric Corp. 74
Advanced Communications Engrg. 78
Airtronics International Corp. 13
Alphaduct Wire & Cable Co. 8
Altec Lansing Corp. 23
American Chain & Cable Co. (Wright Hoist Div.) 60
Associated Engineers, Inc. 80
Auburn Machine Wks., Inc. 71
Automatic Electric Co. 20-21, 44-45

Bashlin Co., W. M. 79
Benner-Nawman, Inc. 23
Berry & Co., L. M. ..... **Inside Front Cover**
Bishop Manufacturing Corp. 49
Buckeye Telephone & Supply Co. 60, 78
Budelman Electronics Corp. 76-77

Chance Co., A. B. 72
Charles Machine Wks., Inc. 68
Collins Radio Co. 31
Commercial Cord Co., Inc. 79, 88
Communication Equipment & Engrg. Co. 69
Copperweld Steel Co. 17
Crane, Inc., Carl C. 80

Davis Construction Co. 80
Dial Haven, Inc. 79
Donnelley & Sons Co., R. R. 30

Ehinger, C. D. 80
Electronic Sec'y Industries, Inc. 6-7

Fitchburg Engrg. Corp. 77
Floor-Con 19

Galv-Weld Products 80
General Cable Corp. 4-5
General Insulated Wire Works, Inc. 73
General Telephone Directory Co. ..... **Back Cover**
Gladwin Plastics, Inc. 61
Graybar Electric Co. 50-51
Greenlee Tool Co. 47

Hamilton Associates, Inc., Allen K. 80
Henkels & McCoy 80
Highway Trailer Co. 79

ITT Kellogg 2-3
Indiana Steel & Wire Co., Inc. 48

Kemode Manufacturing Co., Inc. 80
Klein & Son's ,Mathias 52
Kohler Co. 64
Koppers Co., Inc. 80

Leich Sales Corp. 40-41
Lorain Products Corp. 11

Mast Directory Co., Leland 79
Mathews Co. 79
McCabe Powers Body Co. 65
McGrath Engineering Co. 80
Monsanto Chemical Co. 63
Morrison-Pelsue Co. 69
Murphy Engrg. Laboratories, Inc. 80

Neuses, Inc., P. K. 30
Nippon Electric Co., Ltd. 53
North Electric Co. 26-27

Okonite Co., The 71

Page & Hill, Inc. 87
Parsons Co. 57
Piedmont Wood Preserving Co. 79
Puregas Equip. Corp. 59

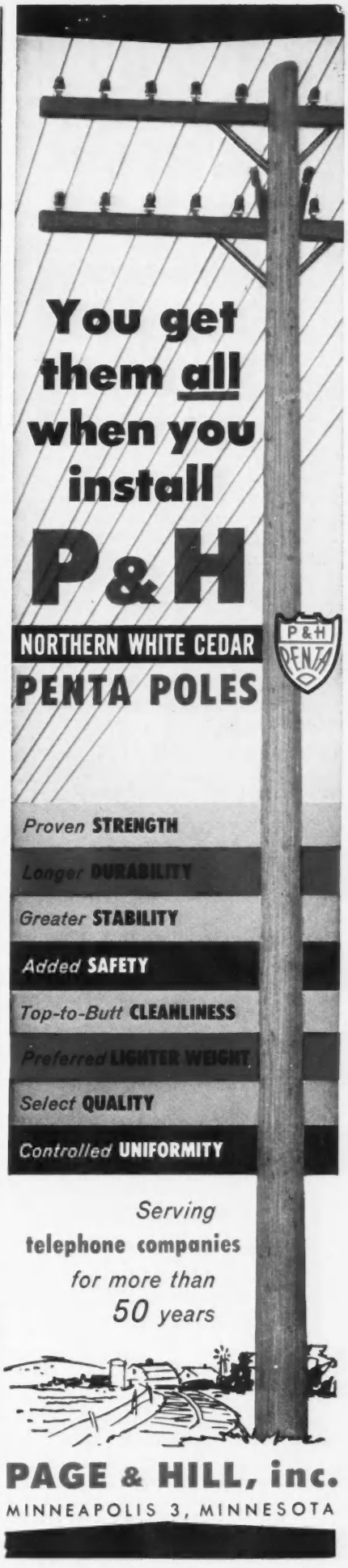
Raytheon Co., (Equipment Div.) 37
Reliable Electric Co. 80
Rolatape, Inc. 56

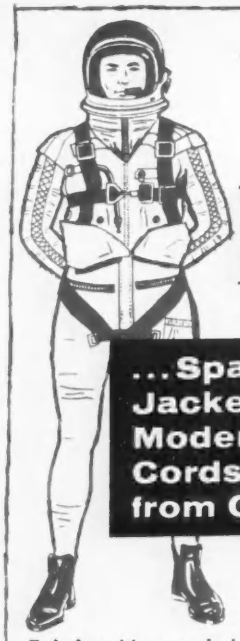
S & G Manufacturing Corp. 68
Schauer Manufacturing Corp. 66
Sherron Metallic Corp. 79
Sierra Electronic Corp. 58
Sloan, Cook & Lowe 80
Stromberg-Carlson 28-29, 81-86
Superior Cable Corp. 15

Taylor-Colquitt Co. 19, 79
Telectric Co. 79
Telephone Engr. Mgmt. 9
Telephone Equipment, Inc. 78
Telephone Repair & Supply Co. 79
Texas Creosoting Co. 79
Thornhill Publishing Co. 76
Transandean Associates 75
Truck Equipment Co. 74
Tudor & Yager 80

U. S. Motors Corp. 62
U. S. Steel Corp. (AS&W) 30
Utility Tool & Body Co. 80

Whitney Blake Co. 55
Williams Inspection Co., Inc., A. W. 80
Winders & Geist, Inc. 80





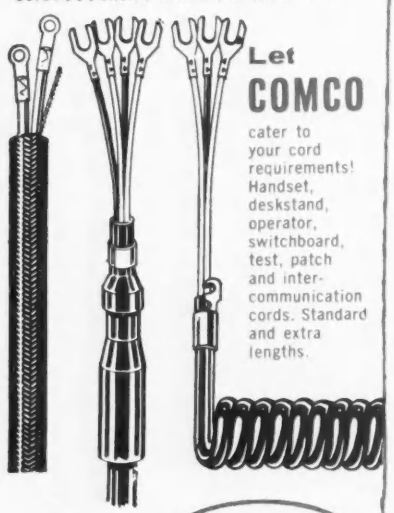
P.V.C.

...Space-Age Jacket for Modern Phone Cords from COMCO

Today's and tomorrow's demands on your system calls for ever tougher, more durable and trouble free equipment. In cords, that's P.V.C. from COMCO,

Superior to Neoprene in toughness and crack resistance, this P.V.C. (Poly-Vinyl-Chloride) jacketing has other advantages, too. Jacket's smoother inner surface permits conductors to flex freely . . . eliminates binding and fracturing —thus assuring longer noise-free life.

P.V.C. jackets are standard on all COMCO straight cords and Spiraflex Rectractile Cords . . . choice of black or ten colors.



Let COMCO cater to your cord requirements! Handset, deskstand, operator, switchboard, test, patch and inter-communication cords. Standard and extra lengths.

Write for Catalog, Samples and Prices

COMCO

COMMERCIAL CORD COMPANY, INC.
CLINTON SPRINGS, N. Y. • HOward 2-2311
Distributed by: LEICH SALES CORP.
427 W. Randolph St., Chicago 6, Illinois
AUTOMATIC ELECTRIC SALES CORP.
Northlake, Ill.

THE BACK OF THE BOOK

By JOHN G. REYNOLDS

Where Bell Meets Telephone

VISITORS in the Houston, Texas, area might suppose that *Bell Road* and *Telephone Road* had been named in honor of the Bell System. But according to Southwestern Bell they would be wrong. "Telephone Road" is a memento of the telephone business, but the "Bell" thus immortalized is a Texas statesman, not A.G.B.

Telephone Road got its name because it had its beginning when the first long distance line between Houston and Galveston was established. Southwestern Telegraph & Telephone Co. leased a right-of-way across open ranch land. The teams and wagons which brought poles and wire to the site blazed a trail in 1883. Later travelers followed this route until the ruts became a road. Now it's an important highway leading out of Houston.

Bell Road is a pleasant, tree-lined residential street developed many years later as Houston boomed. It was named for Texas Governor P. Hansbrough Bell.

Flexibility

WE HAVE the *Tulsa Tribune* to thank for the story about two youngsters who got up early and decided to fix their own breakfast — pancakes.

On the kitchen shelf they found a box of prepared pancake mix. But one part of the directions stumped them — "add one tablespoon shortening."

"Hey, what's shortening?" Teddy asked, and Jim replied: "Never heard of it. Why don't we ask Information?"

So they dialed Information and explained: "We're making pancakes. Can you tell us what shortening is?"

"Of course I can tell you," the operator laughed. "Melted butter will work fine."

So Teddy and Jim had pancakes for breakfast — thanks to Southwestern Bell.

Directory Buffs Bandits

SOME listings in the New York City classified directory are as zany as the history and accomplishments of the book itself. From *Abattoirs to Zippers* you can find such conveniences as *Animal Hair, Anvils, Testimonial Endorsements.* The book has inspired, among other things, a restaurant chain (*Shelled Nuts* listing prompted Bill Black to dub his eateries Chock Full O'Nuts) and a broadway play ("Bells Are Ringing" resulted from an answering service ad).

A company in South America found a unique use for old directories — they ordered 800 copies (which weigh five pounds apiece) to bullet-proof a truck against bandits.

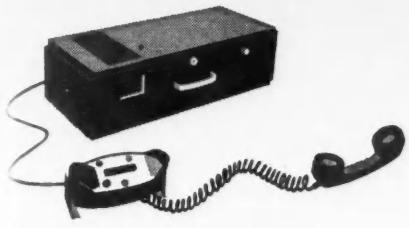
ACHIEVERFONE

installation time:
less than 2 hours!

"Installed in 1 hour and 42 minutes" . . . this is typical of installation reports regarding the new AChieverfone mobile radiotelephone by AC! AChieverfone reduces installation time because it has only two simply mounted units . . . the receiver-transmitter (complete with Selective Signaling decoder and power supply) and control head. These two units can be installed and connected in any car, truck or van with a single factory finished plug-in, control-power cable. In fact, you can install three AChieverfones in the same time it used to take to install *just one* mobile phone of another make. Ease of installation is just one reason why AChieverfone is the best common carrier system available today. It's reliable, low in cost and designed specifically for telephone company use. Consider AChieverfone! It's made to make money for you!

SPECIFICATIONS—FCC Type Accepted

Transmitter: 144-174 Mc
4 channel
RF output: 22.5 watts into 52 ohm load
Receiver: 144-174 Mc
4 channel
Wide Band (60 kc) or Narrow Band (30 kc) models available (Wide Band quickly converted to narrow by substituting IF filter)
Frequency Stability; within 0.0005%
Selective Signaling; 51,000 five-digit (compatible, 2-tone sequential) codes available
Size: Receiver-Transmitter, 21⅛" x 8⅞" x 6¼"
Weight: 35.5 pounds, including receiver-transmitter, control head and cable.



ACHIEVERFONE

Another Versatile Product of

AC Spark Plug *The Electronics Division of General Motors*

Milwaukee 1, Wis. *Telephone BRoadway 3-1120*

Let our "Revenue Men" show you

THE MEANING OF DIRECTORY COOPERATION!

Take a man like
Lew Beeler...

Lew Beeler is one of our "Revenue Men" in Fort Wayne, Indiana.

33 years old, Lew is a veteran of two wars. From 1943 to 1946 he served in the U. S. Navy as an aviation gunner in the South Pacific. In 1950, he returned to the Navy to serve during the Korean crisis.

At age 24, soon after his first Navy hitch, he became the youngest branch manager of a famous furnace manufacturing firm. Following his Korean War service, he worked as sales manager for a large men's store in Lafayette, Indiana.

It was in 1955 that Lew joined General Telephone Directory Company as a sales representative in our Lafayette Unit. In 1957 he was promoted to Sales Supervisor of this unit. And just this year, he was made Sales Supervisor of the Fort Wayne Unit.

Lew and his wife Wilma have three lovely daughters: Sandra Kay, 12; Darci De, 5; and Dani Jo, 3. Surrounded by women at home, Lew's outside activities include membership in such "men only" groups as BPOE, VFW and the American Legion.

Lew Beeler is typical of the "Revenue Men" who work for General Telephone Directory Company and for you. Men who are an asset to any community in which they live.

You get more than extra sales when you put one of our "Revenue Men" to work on your directory.

His manners, his methods will be a positive credit to your company. He'll be welcomed by your advertisers.

He'll work together with you to produce a book you can be proud of. A directory with complete Yellow Pages service—showing the public where to go for all kinds of purchases, rentals and services. A directory with maximum accuracy, maximum revenue.

And you won't have a worry in the world. Selling, publishing and printing are all done to perfection as part of our Complete Directory Service Plan.

Want to know more about it? A phone call or letter to our nearest office will bring a representative on the double.

GENERAL TELEPHONE DIRECTORY COMPANY

1800 Oakton Boulevard
Des Plaines, Ill.
VAnderbilt 4-2164

DIVISION OFFICES: Bloomington, Ill.
Columbia, Mo. • Durham, N. C. • Erie, Pa. • Fort Wayne, Ind.
Honolulu, H. I. • Lexington, Ky. • Long Beach, Calif. • Madison, Wis.
Manila, P. I. • San Angelo, Tex. • San Francisco, Calif. • Spokane, Wash.